FINANCIAL & MANAGERIAL ACCOUNTING

Warren / Reeve / Duchac 13e



Financial and Managerial Accounting 13e

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Financial and Managerial Accounting, 13e

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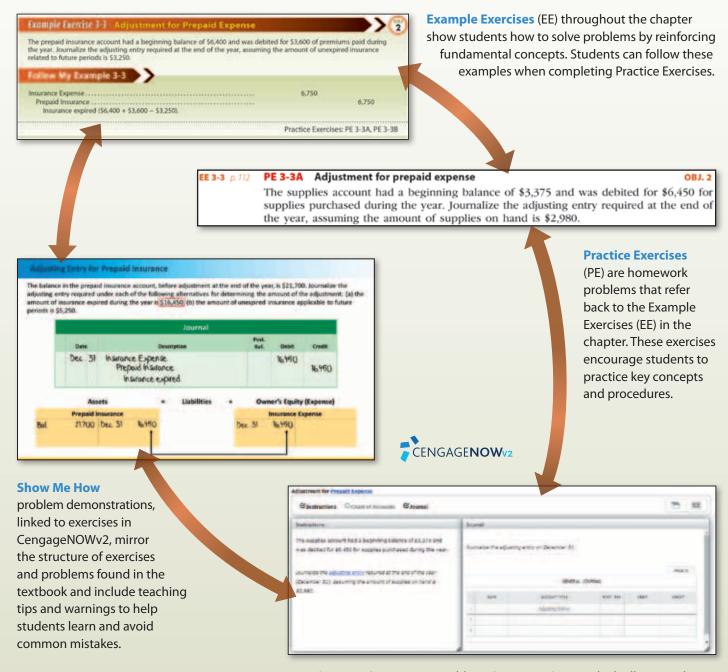
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Warren/Reeve/Duchac Financial and Managerial Accounting & CengageNOWv2

An Integrated Learning System to Keep Students on Track and Progressing!



Practice Exercises are assignable in CengageNOWv2, which allows students to access helpful resources such as Check My Work and Show Me How problem demonstrations.

Set Course Expectations and **Guide Students to Success!**

Motivate students by reshaping their misconceptions about the introductory accounting course. Students are often surprised by both the approach to learning accounting and the necessary amount of time they need to spend outside of class working through homework assignments.

CengageNOWv2 Start-Up Center NEW!



The CengageNOWv2 Start-Up Center will help students identify what they need to do and where they need to focus in order to be successful with a variety of brand new resources.

NEW Success Strategies Module includes **Student Advice Videos** and a **Success** Strategies Tip Sheet to ensure that students understand course expectations (and how they may differ from other courses) and how to best plan and prepare so as to be successful in the introductory accounting course.



The **Student Advice Videos** feature real introductory accounting students giving guidance to students who are just starting the course about what it takes to be successful in introductory accounting.

NEW Math Review Module, designed to help students get up to speed with necessary math skills, includes math review assignments and **Show Me How** math review videos to ensure that students have an understanding of basic math skills, including:

- Whole number operations
- Decimal operations and rounding
- Percentage operations and conversion
- Fraction operations
- · Converting numbers expressed in one form to a different form
- Positive and negative numbers
- Ratios and averages

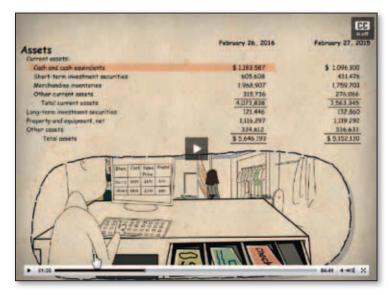
NEW How to Use CengageNOWv2 Module allows students to focus on learning accounting, not on a particular software system. Quickly familiarize your students with CengageNOWv2 and direct them to all of its built-in student resources.

Expose Students to Concepts Before Class Begins!

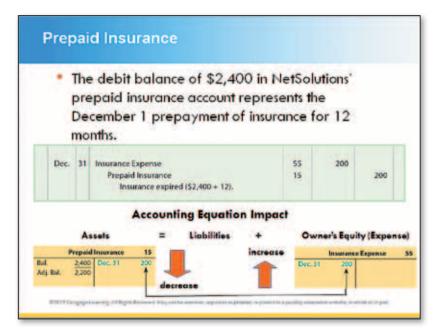
With all the outside obligations accounting students have, finding time to read the textbook before class can be a struggle. Point students to the key concepts they need to know before they attend class.

Video: Animated Activities

Animated Activities are engaging animated scenarios that visually guide students through selected core topics in introductory accounting. Each activity uses a realistic company example to illustrate how the concepts relate to the everyday activities of a business. These activities include multiple-choice questions that gauge student understanding of the overarching chapter concepts.



Animated Activities are assignable/gradable in CengageNOWv2 and available for self-study and review.



Tell Me More lecture activities for every Learning Objective are assignable/gradable in CengageNOWv2 and available for self-study and review.

Video: Tell Me More

NEW!

Tell Me More lecture activities explain the core concepts of the chapter through an engaging auditory and visual presentation that is ideal for all class formats—flipped model, online, hybrid, face-to-face.

Expose Students to Concepts Before Class Begins!

Students don't want to waste time going over concepts that they have already mastered. With the NEW Adaptive Study Plan, they can focus on learning new topics and fully understanding difficult concepts.

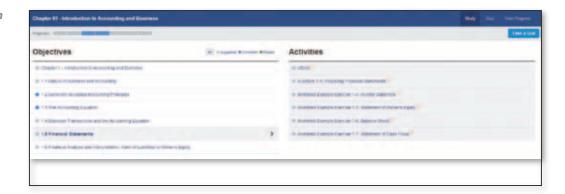


Adaptive Study Plan WEWE



The Adaptive Study Plan in CengageNOWv2 is an assignable/ gradable study center that adapts to each student's unique needs and provides a remediation pathway to keep students progressing.

The Adaptive Study Plan is assignable/gradable in CengageNOWv2 and available for self-study and review.



How does it work?

Step 1: Students take a chapter-level guiz consisting of randomized guestions that cover both conceptual and procedural aspects of the chapter.

Step 2: Feedback is provided for each answer option explaining why the answer is right or wrong.

Step 3: Based on the guiz results, students are provided a remediation path that includes media assets and algorithmic practice problems to help them improve their understanding of the course material.

Instructors may use prerequisites that require students to achieve mastery in the Adaptive Study Plan before moving on to new material.

> The new Adaptive Study Plan offers the benefit of customization coupled with remediation.

> > - Jennifer Schneider, professor at University of North Georgia

Make Content Relatable!

Show students how the material they are learning matters in real life and help them connect accounting concepts to the world around them.



Video: Experience Managerial Accounting

Experience Managerial Accounting Videos, available in CengageNOWv2, show students how progressive companies such as Cold Stone Creamery, Second City, and Hard Rock Café incorporate managerial accounting to fuel better business performance.

Experience Managerial Accounting Videos are assignable/gradable in CengageNOWv2 and available for self-study and review.

Pathways Commission "THIS is accounting!" NEW!



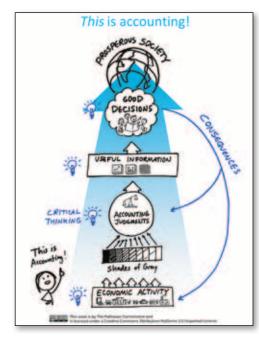
Pathways Commission "THIS is accounting!" illustrates what students should understand as a result of their first exposure to accounting. Incorporated into Chapter 1, this graphic gives students a big picture view of how accounting can lead to a prosperous society.

Service Focus NEW!



Service Focus features highlight the differences between manufacturing companies and service companies and illustrate how managerial accounting concepts apply to service companies such as The Walt Disney Company and Sierra Nevada.





Source: Charting a National Strategy for the **Next Generation of Accountants, The Pathways** Commission, July 2012.

Close the Gap Between **Homework and Exam Performance!**



Good tool to make students understand concepts without overly relying on technology's help.

> - Ramesh Narasimhan, professor at Montclair State University

I like it because it appears to bridge the gap between the homework and my exam.

> Lawrence Chui, professor at University of St. Thomas

This will minimize students' complaints about how the exam looks different from the homework format.

> - Rama Ramamurthy, professor at Georgetown University

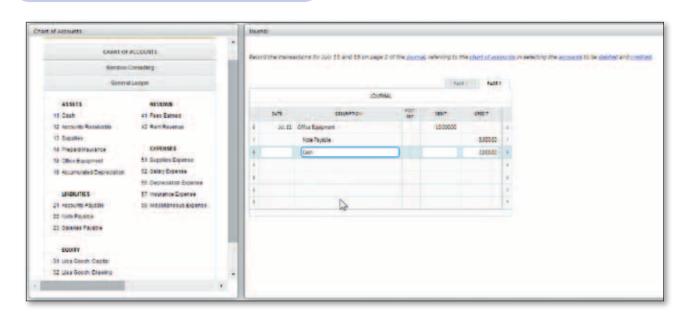
Many students perform well on homework but struggle when it comes to exams. Now, with the new Blank Sheet of Paper Experience, students must problem-solve on their own, just as they would if taking a test on a blank sheet of paper.

Blank Sheet of Paper Experience WEW



A less-leading Blank Sheet of Paper Experience discourages overreliance on the system.

- The use of drop down menus and Smart Entry (type-ahead) has been eliminated.
- · Students must refer to the Chart of Accounts and decide for themselves what account is impacted.
- The number of accounts in each transactions is not given away.
- Whether the account should be debited or credited is not given away.
- Transactions may be entered in any order (as long as the entries are correct).
- Check My Work feedback only reports on what students have actually attempted, which prevents students from "guessing" their way through the assignment.

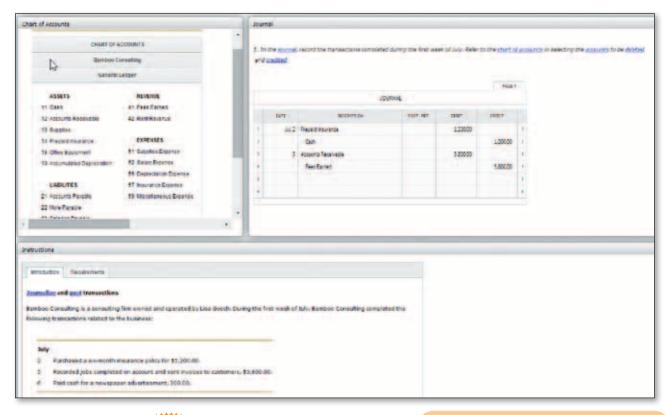


Check it out! Visit cnowv2demo.cengage.com for an interactive demo.

Help Students Make Connections and See the Big Picture!

Homework software should not get in the way of learning. One of the biggest complaints students have about online homework is the scrolling, which prevents students from seeing the big picture and understanding the accounting system. The new Multi-Panel View addresses this issue and enhances student learning.





Multi-Panel View NEW!



The NEW Multi-Panel View in CengageNOWv2 enables students to see all the elements of a problem on one screen.

- Students make connections and see the tasks as connected components in the accounting process.
- Dramatically reduced scrolling eliminates student frustration.

With the ability to move and resize journals, ledgers, forms, and financial statements, it is easier to navigate the problem and understand the accounting system.

This is just a lot better and less confusing than scrolling up and down. . . . Having it like that would make it much easier —not so much scrolling and it wouldn't be so confusing.

> - Tyler Mason, student at Northern Essex Community College

Multi-Panel View makes it much easier for students to see how each piece of the accounting cycle impacts the other pieces. Having it all in one view reduces student frustration and gives them a clearer picture of the complete accounting cycle.

- Kristen Quinn, professor at Northern Essex Community College

Close the Gap Between Homework and Exam Performance!

Students often complete homework at odd times. And when they use CengageNOWv2, they get help right when they need it.



Adaptive Feedback NEW!



Adaptive Feedback in CengageNOWv2 responds to students based upon their unique answers and alerts them to the type of error they have made without giving away the answer.

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	Lea	rning Objective 1					

I like the adaptive feedback. It will reduce a number of errors that cause students to give up.

- Kevin Jones, professor at Drexel University

Excellent! Often learning from feedback is more powerful than learning from the instructor, text, etc.

- Lisa Brown, professor at Indiana Institute of Technology

JOURNAL Score: 33/138 DATE DESCRIPTION Office Equipment 8.000.00 Note Payaable is a minor spelling error in the account title. You will be graded as if you had ed "Note Payable." amount for this account is incorrect, although you've entered the amount in the

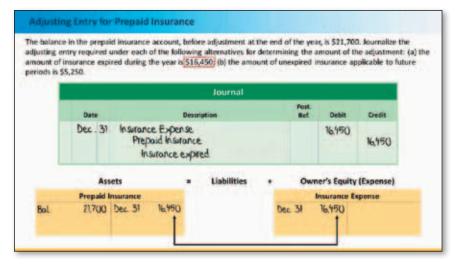
> In addition to groundbreaking, adaptive feedback, CengageNOWv2 continues to provide multiple layers of guidance to keep students on track and progressing.

- Check My Work Feedback provides general guidance and hints as students work through homework assignments.
- NEW Check My Work Feedback in CengageNOWv2 now only reports on what students have actually attempted, which prevents them from "guessing" their way through assignments.
- **Explanations** are available after the assignment has been submitted and provide a detailed description of how to arrive at the solution.

Check it out! Visit cnowv2demo.cengage.com for an interactive demo.

Help Students Make Connections and See the Big Picture!

The best way to learn accounting is through practice, but students often get stuck when attempting homework assignments on their own.



Video: Show Me How

Created for the most frequently assigned end-of-chapter items, hundreds of NEW Show Me How problem demonstration videos provide a step-by-step model of a similar problem. Embedded tips and warnings help students avoid common mistakes and pitfalls.

Identified by an icon in the text margins, Show Me How videos are linked to assignments in CengageNOWv2 and available for self-study and review.

Blueprint Problems

Blueprint Problems are teaching problems that walk students through a single accounting topic. These problems cover the primary learning objectives and are designed to help students understand foundational content and the associated building blocks versus memorizing the formulas or journal entries.



Blueprint Problems are assignable/ gradable in CengageNOWv2.

NetSolutions Continuing Case Study

Students follow a fictitious company, NetSolutions, which demonstrates a rich variety of transactions. The continuity of presentation helps students master difficult concepts such as the accounting cycle.

Help Students Go Beyond Memorization to True Understanding!

Students often struggle to understand how concepts relate to one another. For most students, an introductory accounting course is their first exposure to both business transactions and the accounting system. While these concepts are already difficult to master individually, their combination and interdependency in the introductory accounting course often pose a challenge for students.



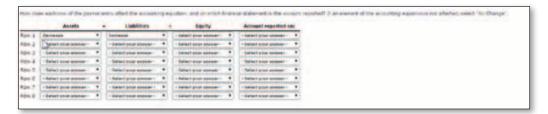
Dynamic Exhibits NEW!

To overcome this gap, the authors have created a series of interactive Dynamic Exhibits that allow students to change the variables in a scenario and see how a change ripples through the accounting system. Dynamic Exhibits allow students to see connections and relationships like never before!

Identified by an icon in the text, Dynamic Exhibits are embedded within the MindTap eReader in CengageNOWv2. They are assignable/gradable in CengageNOWv2 and available for self-study and review.

Blueprint Connections

Blueprint Connections are scenario-based teaching problems that solidify concepts and demonstrate their interrelationships, as well as promote critical thinking. Blueprint Connections combine multiple topics, allowing students to explore a larger concept more fully, and strengthen analytical skills.



Blueprint Connections are assignable/gradable in CengageNOWv2.

Help Students Build Critical Thinking Skills!

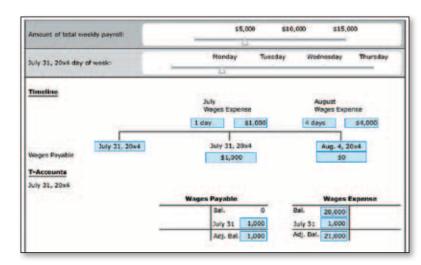
Students often resort to memorization as a way to pass the course, but such surface learning does little to develop the critical thinking skills and deep understanding that are necessary for success in future business courses.

Activation Exercises

To overcome these challenges, the authors have created Activation Exercises to provide a learning system that focuses on developing a better understanding of:

- · Key terms and definitions
- Economics of business transactions
- How transactions are recorded in the accounting system
- How transactions are ultimately reflected in the financial statements

These "what if" exercises help students understand relationships using interactive tools.



The Activation Exercises are assignable/gradable in CengageNOWv2.

These exercises are interactive and actually allow students to experiment with the data, visually viewing the impact when data is altered. The exercises show not only how a transaction looks in the journal and ledger accounts, but also the impact it ultimately has on financial statements. Finally, students are challenged to analyze the overall impact of a transaction by answering questions related to the topic. This is an excellent learning tool.

- Rita Mintz, professor at Calhoun Community College

The Activation Exercises structure builds the critical thinking skills that are necessary for students to succeed in both introductory accounting and future accounting courses. Reviewers have enthusiastically praised the authors' online activities and indicated that they would be both ideal for pre-class activities and after-class assignments.



Financial Statement Analysis and Interpretation

The Financial Statement Analysis and Interpretation sections, at the end of financial accounting chapters, help students understand key ratios and how stakeholders interpret financial reports. These sections encourage students to go deeper into the material to analyze accounting information and improve critical thinking skills.

Online Solutions



CengageNOWv2 is a powerful course management and online homework resource that provides control and customization to optimize the student learning experience. Included are many proven resources including algorithmic activities, test bank, course management tools, reporting and assessment options, and much more.

Recent CengageNOW Enhancements WEWL



- Refreshed Design: This refreshed look will help you and your students focus easily and quickly on what is important, while maintaining the same functionality that CengageNOW users know and love.
- Integration with Popular Learning Management Systems: Single login, deep linking, and grade return! (Check with your local Learning Consultant for more details!)
- Upload Files Capability: You can now upload files in CengageNOW for student use including videos, Excel files, Word files, and more.
- Email Instructor Feature: Students can now send you a screenshot of the question they are working on directly through CengageNOW and ask specific questions about where they are stuck.
- Better Date Management: When modifying assignment due dates for a whole course, the system will now automatically adjust due dates based on a new start date, making it easier to reuse a course from one term to the next and adjust for snow days.
- Streamlined Assignment Creation Process: A simplified and streamlined Assignment Creation process allows instructors to quickly set up and manage assignments from a single page!
- New Report Options: New reporting options allow you to get better reports on your students' progress.
- New Student Registration Process: When you create a course, a URL will be generated that will automatically take students right into the instructor's course without them having to enter the course key!





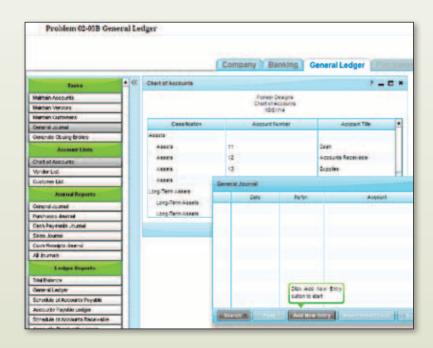
MindTap eReader

The MindTap eReader for Warren/Reeve/ Duchac's Financial and Managerial Accounting is the most robust digital reading experience available. Hallmark features include:

- Fully optimized for the iPad.
- · Note taking, highlighting, and more.
- Embedded digital media such as Dynamic Exhibits.

The MindTap eReader also features ReadSpeaker®, an online text-to-speech application that vocalizes, or "speech-enables," online educational content. This feature is ideally suited for both instructors and learners who would like to listen to content instead of (or in addition to) reading it.





Cengage Learning General Ledger Software (CLGL)

CLGL exposes students to computerized accounting software without teaching the specifics of a certain software system— preparing students for *any* software program they might encounter in the real world.

- Now available in CengageNOWv2, CLGL allows students to work through end-of-chapter assignments and practice sets in a format that emulates commercial general ledger software, but in a manner that is more forgiving of errors.
- Assignments are automatically graded online.
- Selected problems that can be solved using CLGL are designated by an icon in the textbook and are listed in the assignment preparation grid in the Instructor's Manual.

New to This Edition

In addition to the many new digital assets created for this edition of *Financial and Managerial Accounting*, the textbook content itself has also been revised. The most significant changes for this edition involve the inclusion of the new revenue recognition standard and a greater emphasis on service companies in the managerial accounting chapters.

In all chapters, the following improvements have been made:

- Updated dates and real company information for currency
- Added headers and sub-headers to help students navigate through the chapter and easily reference sections when completing homework assignments
- Set unlabeled graphics as numbered exhibits for easier student reference
- Used more bulleted lists to call students' attention to specific information
- Refreshed end-of-chapter assignments with different numerical values and updated information

The new revenue recognition standard required the following changes:

- Revised the definitions of revenue and revenue recognition in Chapters 1–3, including the glossary. These revisions are consistent with the new revenue recognition standard, Revenue from Contracts with Customers (Topic 606), FASB, May 2014.
- Revised Chapter 5, Accounting for Merchandising Businesses, to be consistent with the preceding standard. These revisions include using the net method for all purchase and sales discounts. In addition, the accounting for customer returns and allowances, including cash refunds, has been updated. As a result, sales discounts and sales return and allowances accounts are no longer used.
- Added new Appendix D, Revenue Recognition, which
 describes and illustrates the new Five-Step process
 for recognizing revenue. The illustration includes
 the accounting for a bundled product with different
 performance obligations.

Chapter 1

 New Business Connection includes The Pathways Commission definition of accounting

Chapter 2

- New Business Connection on Microsoft's unearned revenue Chapter 3
- New chapter opener on Pandora
- Revised introduction to revenue recognition
- New Business Connection on Microsoft dealing with unearned revenue for support services

Chapter 4

- New chapter opener on Zynga
- Updated exposition of Appendix 1 showing end-ofperiod spreadsheet usage

Chapter 5

 Updated the Sales Discounts and Sales Returns and Allowances discussion for accuracy with the new revenue recognition standard

Chapter 9

New chapter opener on McDonald's

Chapter 10

- New chapter opener on Starbucks
- Updated Exhibit 3 to reflect current wage withholding rates

Chapter 12

 Updated learning objective 1 to more clearly explain alternatives in financing corporations

Chapter 13

- New chapter opener on The Coca-Cola Company
- Significantly streamlined learning objective 5
- New Business Connection on cash and investments in the pharmaceutical industry

Chapter 14

- New chapter opener on National Beverage Co.
- Updated Exhibit 1 to more clearly detail specific examples of sources and uses of cash

Chapter 16

 New exhibit with income statements for merchandising and manufacturing businesses

Chapter 17

- New Service Focus on job order costing in a law firm
- Chapter 19

• New chapter opener on Ford Motor Company

Chapter 20

• New exhibit explaining the difference between absorption costing and variable costing

Chapter 21

- New chapter opener on Hendrick Motorsport
- New Service Focus on film budgeting
- Updated two learning objectives to reflect the differences between operating and financial budgets
- New Exhibit 7 on the master budget for a manufacturing company

Chapter 22

- New Business Connection on standard costing for breweries
- New Service Focus on standard costing in the restaurant industry

Chapter 23

• New Service Focus on Charles Schwab

Chapter 25

- New chapter opener on Vail Resorts, Inc.
- New Service Focus on network business models

Chapter 26

New exhibit explaining allocation of factory overhead costs
 Chapter 27

- New exhibit explaining costs of controlling quality
- Updated "just-in-time inventory" description to reflect more current "lean inventory" description

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Instructor Resources

Solutions Manual

Author-written and carefully verified multiple times to ensure accuracy and consistency with the text, the Solutions Manual contains answers to the Discussion Questions, Practice Exercises, Exercises, Problems (Series A and Series B), Cases, and Continuing Problems that appear in the text. These solutions help you easily plan, assign, and efficiently grade assignments.

Test Bank NEW!

NEW for this edition, Test Bank content is now delivered in an online platform. Cengage Learning Testing Powered by Cognero is a flexible, online system that allows you to:

- Author, edit, and manage test bank content from multiple Cengage Learning solutions
- Create multiple test versions in an instant
- Deliver tests from your LMS, your classroom, or wherever you want

Also *NEW* for this edition, 100 new Test Bank questions have been added (in addition to revising numeric values for approximately 20% of the existing questions).

Companion Web Site

This robust companion Web site provides immediate access to a rich array of teaching and learning resources—including the Instructor's Manual, PowerPoint slides, and Excel Template Solutions. Easily download the instructor resources you need from the password-protected, instructor-only section of the site.

Instructor's Manual Discover new ways to engage your students by utilizing the Instructor's Manual ideas for class discussion, group learning activities, writing exercises, and Internet activities. Moreover, simplify class preparation by reviewing a brief summary of each chapter, a detailed chapter synopsis (NEW for this edition), teaching tips regarding a suggested approach to the material, questions students frequently ask in the classroom, lecture aids, and demonstration problems in the Instructor's Manual. Transparency Masters and

Handouts (with solutions) are also included. Quickly identify the assignments that best align with your course with the assignment preparation grid that includes information about learning objective coverage, difficulty level and Bloom's taxonomy categorization, time estimates, and accrediting standard alignment for business programs, AICPA, ACBSP, and IMA.

PowerPoint Slides Bring your lectures to life with slides designed to clarify difficult concepts for your students. The lecture PowerPoints include key terms and definitions, equations, examples, exhibits, and all Example Exercises (with solutions) from the textbook.

- NEW for this edition, descriptions for all graphics in the PowerPoints have been added to enhance PowerPoint usability for students with disabilities.
- Two separate PowerPoint decks that include just the Example Exercises (and solutions) and just the Exhibits from the textbook are ideal for instructors that create their own PowerPoint decks and just want to refresh them.

end-of-chapter exercises and problems to assist the student as they set up and work the problem. Certain cells are coded to display a red asterisk when an incorrect answer is entered, which helps students stay on track. Selected problems that can be solved using these templates are designated by an icon in the textbook and are listed in the assignment preparation grid in the Instructor's Manual. The Excel Template Solutions provide answers to these templates.

NEW for this edition, 10 more Excel Templates have been added.

Practice Set Solutions Establish a fundamental understanding of the accounting cycle for your students with Practice Sets, which require students to complete one month of transactions for a fictional company. Brief descriptions of each practice set are provided in the table of contents. The Practice Set Solutions provide answers to these practice sets.

Student Resources

Study Guide

Now available free in CengageNOWv2, the Study Guide allows students to easily assess what they know with a "Do You Know" checklist covering the key points in each chapter. To further test their comprehension, students can work through Practice Exercises, which include a "strategy" hint and solution so they can continue to practice applying key accounting concepts.

Working Papers

Now available free in CengageNOWv2, students will find the tools they need to help work through end-of-chapter assignments with these working papers. The preformatted templates provide a starting point by giving students a basic structure for problems and journal entries. Working Papers are also available in a printed format as a bundle option.

Practice Sets

GeneralLEDGER

For more in-depth application of accounting practices, instructors may choose from among six different Practice Sets for long-term assignments. Each Practice Set requires students to complete one month of transactions for a fictional company. Practice Sets can be solved manually or with the Cengage Learning General Ledger software.

Web Site

Designed specifically for your students' accounting needs, this Web site features student PowerPoint slides, Excel Templates, learning games, and flashcards.

• **PowerPoint Slides:** Students can easily take notes or review difficult concepts with the student version of this edition's PowerPoint slides.



- Excel Templates: These Excel Templates help students stay on track. If students enter an incorrect answer in certain cells, a red asterisk will appear to let them know something is wrong. Problems that can be solved using these templates are designated by an icon.
- **Crossword Puzzles:** Students can focus on learning the key terms and definitions for each chapter in a different way by completing these crossword puzzles.
- **Flashcards:** Students can prepare with these flashcards, which cover the key terms and definitions they need to know for each chapter.

Acknowledgements

The many enhancements to this edition of *Financial and Managerial Accounting* are the direct result of one-on-one interviews, surveys, reviews, WebExes, and focus groups with over 300 instructors and students at institutions across the country over the past two years. We would like to take this opportunity to thank those who helped us better understand the challenges of the principles of accounting course and provided valuable feedback on our content and digital assets.

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Practice Set: Fit & Fashionable

This set is a merchandising business operated as a proprietorship. It includes business documents, and it can be solved manually or with the General Ledger software.

Practice Set: Chic Events by Jada

This set includes payroll transactions for a merchandising business operated as a proprietorship. It includes business documents, and it can be solved manually or with the General Ledger software.

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Practice Set: My Place, House of Décor

This set is a service and merchandising business operated as a corporation. It includes narrative for six months of transactions, which are to be recorded in a general journal. The set can be solved manually or with the General Ledger software.

Practice Set: JP's Tech Solutions

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Visit the companion Web site at www.cengagebrain.com

Appendix F: Special Journals and Subsidiary Ledgers (online)

Visit the companion Web site at www.cengagebrain.com

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Introduction to Accounting and Business

Twitter

hen two teams pair up for a game of football, there is often a lot of noise. The band plays, the fans cheer, and fireworks light up the scoreboard. Obviously, the fans are committed and care about the outcome of the game. Just like fans at a football game, the owners of a business want their business to "win" against their competitors in the marketplace. While having your football team win can be a source of pride, winning in the marketplace goes beyond pride and has many tangible benefits. Companies that are winners are better able to serve customers, provide good jobs for employees, and make money for their owners.

Twitter is one of the most visible companies on the Internet. It provides a real-time information network where members can post messages, called Tweets, of up to 140 characters for free. Millions post Tweets every day throughout the world.

Do you think Twitter is a successful company? Does it make money? How would you know? Accounting helps to answer these questions.

This textbook introduces you to accounting, the language of business. Chapter 1 begins by discussing what a business is, how it operates, and the role that accounting plays.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe the nature of a business and the role of accounting and ethics in business. Nature of Business and Accounting Types of Businesses Role of Accounting in Business Role of Ethics in Accounting and Business Opportunities for Accountants	
Summarize the development of accounting principles and relate them to practice. Generally Accepted Accounting Principles Business Entity Concept Cost Concept	EE 1-1
State the accounting equation and define each element of the equation. The Accounting Equation	EE 1-2
Describe and illustrate how business transactions can be recorded in terms of the resulting change in the elements of the accounting equation. Business Transactions and the Accounting Equation	EE 1-3
Describe the financial statements of a corporation and explain how they interrelate. Financial Statements Income Statement Retained Earnings Statement Balance Sheet Statement of Cash Flows Interrelationships Among Financial Statements	EE 1-4 EE 1-5 EE 1-6 EE 1-7
Describe and illustrate the use of the ratio of liabilities to stockholders' equity in evaluating a company's financial condition. Financial Analysis and Interpretation: Ratio of Liabilities to Stockholders' Equity At a G	EE 1-8 ance 1 Page 23

Describe the nature of business and the role of accounting and ethics in business.

Nature of Business and Accounting

A **business**¹ is an organization in which basic resources (inputs), such as materials and labor, are assembled and processed to provide goods or services (outputs) to customers. Businesses come in all sizes, from a local coffee house to **Starbucks**, which sells over \$10 billion of coffee and related products each year.

The objective of most businesses is to earn a **profit**. Profit is the difference between the amounts received from customers for goods or services and the amounts paid for the inputs used to provide the goods or services. This text focuses on businesses operating to earn a profit. However, many of the same concepts and principles also apply to not-for-profit organizations such as hospitals, churches, and government agencies.

Types of Businesses

Three types of businesses operating for profit include service, merchandising, and manufacturing businesses. Some examples of each type of business follow:

- Service businesses provide services rather than products to customers.
 Delta Air Lines (transportation services)
 - The Walt Disney Company (entertainment services)
- **Merchandising businesses** sell products they purchase from other businesses to customers.

Walmart (general merchandise)
Amazon.com (Internet books, music, videos)

¹ A complete glossary of terms appears at the end of the text.

 Manufacturing businesses change basic inputs into products that are sold to customers.

Ford Motor Co. (cars, trucks, vans)
Dell Inc. (personal computers)

Role of Accounting in Business

The role of accounting in business is to provide information for managers to use in operating the business. In addition, accounting provides information to other users in assessing the economic performance and condition of the business.

Thus, **accounting** can be defined as an information system that provides reports to users about the economic activities and condition of a business. You could think of accounting as the "language of business." This is because accounting is the means by which businesses' financial information is communicated to users.

The process by which accounting provides information to users is as follows:

- 1. Identify users.
- 2. Assess users' information needs.
- 3. Design the accounting information system to meet users' needs.
- 4. Record economic data about business activities and events.
- 5. Prepare accounting reports for users.

As illustrated in Exhibit 1, users of accounting information can be divided into two groups: internal users and external users.

Note:

Accounting is an information system that provides reports to users about the economic activities and condition of a business.

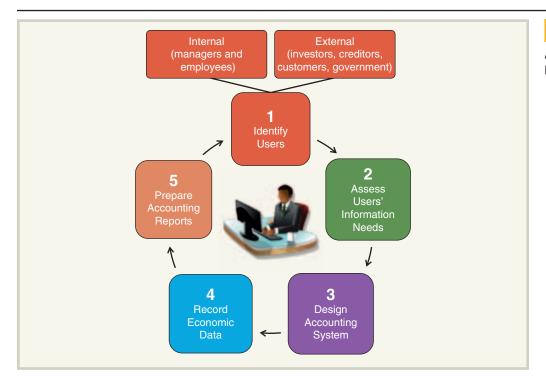


EXHIBIT 1

Accounting as an Information System

Managerial Accounting Internal users of accounting information include managers and employees. These users are directly involved in managing and operating the business. The area of accounting that provides internal users with information is called managerial accounting, or management accounting.

The objective of managerial accounting is to provide relevant and timely information for managers' and employees' decision-making needs. Oftentimes, such information is sensitive and is not distributed outside the business. Examples of sensitive information might include information about customers, prices, and plans to expand the business. Managerial accountants employed by a business are employed in **private accounting**.

Financial Accounting External users of accounting information include investors, creditors, customers, and the government. These users are not directly involved in managing and operating the business. The area of accounting that provides external users with information is called **financial accounting**.

The objective of financial accounting is to provide relevant and timely information for the decision-making needs of users outside of the business. For example, financial reports on the operations and condition of the business are useful for banks and other creditors in deciding whether to lend money to the business. General-purpose financial statements are one type of financial accounting report that is distributed to external users. The term *general-purpose* refers to the wide range of decision-making needs that these reports are designed to serve. Later in this chapter, general-purpose financial statements are described and illustrated.



Role of Ethics in Accounting and Business

The objective of accounting is to provide relevant, timely information for user decision making. Accountants must behave in an ethical manner so that the information they provide users will be trustworthy and, thus, useful for decision making. Managers and employees must also behave in an ethical manner in managing and operating a business. Otherwise, no one will be willing to invest in or loan money to the business.

Ethics are moral principles that guide the conduct of individuals. Unfortunately, business managers and accountants sometimes behave in an unethical manner. Many of the managers of the companies listed in Exhibit 2 engaged in accounting or business fraud. These ethical violations led to fines, firings, and lawsuits. In some cases, managers were criminally prosecuted, convicted, and sent to prison.

EXHIBIT 2

Accounting and Business Frauds

Company	Nature of Accounting or Business Fraud	Result
Computer Associates International, Inc.	Fraudulently inflated its financial results.	CEO and senior executives indicted. Five executives pled guilty. \$225 million fine.
Enron	Fraudulently inflated its financial results.	Bankrupcty. Senior executives criminally convicted. More than \$60 billion in stock market losses.
HealthSouth	Overstated performance by \$4 billion in false entries.	Senior executives criminally convicted.
Qwest Communications International, Inc.	Improperly recognized \$3 billion in false receipts.	CEO and six other executives criminally convicted of "massive financial fraud." \$250 million SEC fine.
Xerox Corporation	Recognized \$3 billion in revenue prior to when it should have been recorded.	\$10 million fine to SEC. Six executives forced to pay \$22 million.

What went wrong for the managers and companies listed in Exhibit 2? The answer normally involved one or both of the following two factors:

• Failure of Individual Character. Ethical managers and accountants are honest and fair. However, managers and accountants often face pressures from supervisors to meet company and investor expectations. In many of the cases in Exhibit 2, managers and accountants justified small ethical violations to avoid such pressures. However, these small violations became big violations as the company's financial problems became worse.

• Culture of Greed and Ethical Indifference. By their behavior and attitude, senior managers set the company culture. In most of the companies listed in Exhibit 2, the senior managers created a culture of greed and indifference to the truth.

As a result of the accounting and business frauds shown in Exhibit 2, Congress passed laws to monitor the behavior of accounting and business. For example, the **Sarbanes-Oxley Act (SOX)** was enacted. SOX established a new oversight body for the accounting profession called the **Public Company Accounting Oversight Board (PCAOB)**. In addition, SOX established standards for independence, corporate responsibility, and disclosure.

How does one behave ethically when faced with financial or other types of pressure? Guidelines for behaving ethically follow:²

- 1. Identify an ethical decision by using your personal ethical standards of honesty and fairness.
- 2. Identify the consequences of the decision and its effect on others.
- 3. Consider your obligations and responsibilities to those who will be affected by your decision.
- 4. Make a decision that is ethical and fair to those affected by it.

Integrity, Objectivity, and Ethics in Business



BERNIE MADOFF

In June 2009, Bernard L. "Bernie" Madoff was sentenced to 150 years in prison for defrauding thousands of investors in one of the biggest frauds in American history. Madoff's fraud started several decades earlier when he began a "Ponzi scheme" in his investment management firm, Bernard L. Madoff Investment Securities LLC.

In a Ponzi scheme, the investment manager uses funds received from new investors to pay a return to existing investors, rather than basing investment returns on the fund's actual performance. As long as the investment manager is able to attract new investors, he or she will have new funds to pay existing investors and continue the fraud. While most Ponzi schemes collapse quickly when the investment manager runs out of new investors, Madoff's reputation, popularity, and personal contacts provided a steady stream of investors, which allowed the fraud to survive for decades.

Opportunities for Accountants

Numerous career opportunities are available for students majoring in accounting. Currently, the demand for accountants exceeds the number of new graduates entering the job market. This is partly due to the increased regulation of business caused by the accounting and business frauds shown in Exhibit 2. Also, more and more businesses have come to recognize the importance and value of accounting information.

As indicated earlier, accountants employed by a business are employed in private accounting. Private accountants have a variety of possible career options within a company. Some of these career options are shown in Exhibit 3 along with their starting salaries. Accountants who provide audit services, called *auditors*, verify the accuracy of financial records, accounts, and systems. As shown in Exhibit 3, several private accounting careers have certification options.

Accountants and their staff who provide services on a fee basis are said to be employed in **public accounting**. In public accounting, an accountant may practice as an individual or as a member of a public accounting firm. Public accountants who have met a state's education, experience, and examination requirements may become **Certified Public Accountants (CPAs)**. CPAs typically perform general accounting,

² Many companies have ethical standards of conduct for managers and employees. In addition, the Institute of Management Accountants and the American Institute of Certified Public Accountants have professional codes of conduct, which can be obtained from their Web sites at www.imanet.org and www.aicpa.org, respectively.

EXHIBIT 3

Accounting Career Paths and Salaries

Accounting Career Track	Description	Career Options	Annual Starting Salaries*	Certification
Private Accounting	Accountants employed by companies, government, and not-for-profit entities.	Bookkeeper Payroll clerk General accountant Budget analyst Cost accountant Internal auditor Information technology auditor	\$39,750 \$38,250 \$46,375 \$49,375 \$48,375 \$53,875 \$62,875	Certified Payroll Professional (CPP) Certified Management Accountant (CMA) Certified Internal Auditor (CIA) Certified Information Systems Auditor (CISA)
Public Accounting	Accountants employed individually or within a public accounting firm in tax or audit services.	Local firms National firms	\$48,500 \$58,625	Certified Public Accountant (CPA) Certified Public Accountant (CPA)

^{*}Mean salaries of a reported range. Private accounting salaries are reported for large companies. Salaries may vary by region. Source: Robert Half 2013 U.S. Salary Guide (Finance and Accounting), Robert Half International, Inc. (http://www.rhi.com/salaryguides)

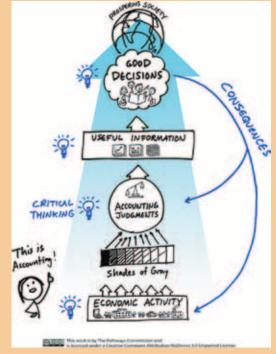
audit, or tax services. As can be seen in Exhibit 3, CPAs have slightly better starting salaries than private accountants. Career statistics indicate, however, that these salary differences tend to disappear over time.

Because all functions within a business use accounting information, experience in private or public accounting provides a solid foundation for a career. Many positions in industry and in government agencies are held by individuals with accounting backgrounds.



PATHWAYS COMMISSION

The Pathway Commission recently issued its study titled Charting a National Strategy for the Next Generation of Accountants. The Commission was made up of diverse members and was jointly sponsored by the American Institute of Certified Public Accountants (AICPA) and the American Accounting Association (AAA). The Commission emphasized the importance of accounting for a prosperous society and good decision making. The Commission also emphasized that accountants must be critical thinkers who are comfortable addressing the shades of grey required by accounting judgments.



Sources: Charting a National Strategy for the Next Generation of Accountants, The Pathways Commission, July 2012.

Generally Accepted Accounting Principles

If a company's management could record and report financial data as it saw fit, comparisons among companies would be difficult, if not impossible. Thus, financial accountants follow generally accepted accounting principles (GAAP) in preparing reports. These reports allow investors and other users to compare one company to another.

Accounting principles and concepts develop from research, accepted accounting practices, and pronouncements of regulators. Within the United States, the Financial Accounting Standards Board (FASB) has the primary responsibility for developing accounting principles. The FASB publishes Statements of Financial Accounting Standards as well as Interpretations of these Standards. In addition, the Securities and Exchange Commission (SEC), an agency of the U.S. government, has authority over the accounting and financial disclosures for companies whose shares of ownership (stock) are traded and sold to the public. The SEC normally accepts the accounting principles set forth by the FASB. However, the SEC may issue Staff Accounting Bulletins on accounting matters that may not have been addressed by the FASB.

Many countries outside the United States use generally accepted accounting principles adopted by the International Accounting Standards Board (IASB). The IASB issues International Financial Reporting Standards (IFRSs). Differences currently exist between FASB and IASB accounting principles. However, the FASB and IASB are working together to reduce and eliminate these differences into a single set of accounting principles. Such a set of worldwide accounting principles would help facilitate investment and business in an increasingly global economy.

In this chapter and text, accounting principles and concepts are emphasized. It is through this emphasis on the "why" as well as the "how" that you will gain an understanding of accounting.





International 🎇 Connection



IFRS INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS)

IFRS are considered to be more "principles-based" than U.S. GAAP, which is considered to be more "rules-based." For example, U.S. GAAP consists of approximately 17,000 pages, which include numerous industry-specific accounting rules. In contrast, IFRS allow more judgment in deciding how business transactions are recorded. Many believe that the strong regulatory and litigation environment in the United States is the cause for the more rules-based GAAP approach. Regardless, IFRS and GAAP share many common principles.*

*Differences between U.S. GAAP and IFRS are further discussed and illustrated in Appendix C.

Business Entity Concept

The business entity concept limits the economic data in an accounting system to data related directly to the activities of the business. In other words, the business is viewed as an entity separate from its owners, creditors, or other businesses. For example, the accountant for a business with one owner would record the activities of the business only and would not record the personal activities, property, or debts of the owner.

A business entity may take the form of a proprietorship, partnership, corporation, or limited liability company (LLC). Each of these forms and their major characteristics are listed in Exhibit 4.

The three types of businesses discussed earlier—service, merchandising, and manufacturing—may be organized as proprietorships, partnerships, corporations, or limited liability companies. Because of the large amount of resources required to operate a manufacturing business, most manufacturers such as Ford Motor Company are corporations. Most large retailers such as Walmart and Home Depot are also corporations.

Note:

Under the business entity concept, the activities of a business are recorded separately from the activities of its owners, creditors, or other businesses.

EXHIBIT 4

Forms of Business Entities

Forn	n of Business Entity	Characteristics	Examples
•	Proprietorship is owned by one individual.	 70% of business entities in the United States. Easy and inexpensive to organize. Resources are limited to those of the owner. Used by small businesses. 	• A & B Painting
H	Partnership is owned by two or more individuals.	 10% of business organizations in the United States (combined with limited liability companies). Combines the skills and resources of more than one person. 	Jones & Smith, Architects
X1.COPORCIA	Corporation is organized under state or federal statutes as a separate legal taxable entity.	 Generates 90% of business revenues. 20% of the business organizations in the United States. Ownership is divided into shares called stock. Can obtain large amounts of resources by issuing stock. Used by large businesses. 	AppleGoogleFord Motor Company
H	Limited liability company (LLC) combines the attributes of a partnership and a corporation.	 10% of business organizations in the United States (combined with partnerships). Often used as an alternative to a partnership. Has tax and legal liability advantages for owners. 	Mosel & Farmer, CPAs, LLC

Companies organized as corporations often include Inc. as part of their name to indicate that they are incorporated. For example, Apple's legal name is Apple Inc.

Cost Concept

Under the **cost concept**, amounts are initially recorded in the accounting records at their cost or purchase price. To illustrate, assume that Aaron Publishers purchased the following building on February 20, 2014, for \$150,000:

Price listed by seller on January 1, 2014	\$160,000
Aaron Publishers' initial offer to buy on January 31, 2014	140,000
Purchase price on February 20, 2014	150,000
Estimated selling price on December 31, 2016	220,000
Assessed value for property taxes, December 31, 2016	190,000

Under the cost concept, Aaron Publishers records the purchase of the building on February 20, 2014, at the purchase price of \$150,000. The other amounts listed have no effect on the accounting records.

The fact that the building has an estimated selling price of \$220,000 on December 31, 2016, indicates that the building has increased in value. However, to use the \$220,000 in the accounting records would be to record an illusory or unrealized profit. If Aaron Publishers sells the building on January 9, 2018, for \$240,000, a profit of \$90,000 (240,000 - 150,000) is then realized and recorded. The new owner would record 240,000 as its cost of the building.

The cost concept also involves the objectivity and unit of measure concepts. The **objectivity concept** requires that the amounts recorded in the accounting records be based on objective evidence. In exchanges between a buyer and a seller, both try to get the best price. Only the final agreed-upon amount is objective enough to be recorded in the accounting records. If amounts in the accounting records were constantly being revised upward or downward based on offers, appraisals, and opinions, accounting reports could become unstable and unreliable.

The unit of measure concept requires that economic data be recorded in dollars. Money is a common unit of measurement for reporting financial data and reports.

Example Exercise 1-1 Cost Concept





On August 25, Gallatin Repair Service extended an offer of \$125,000 for land that had been priced for sale at \$150,000. On September 3, Gallatin Repair Service accepted the seller's counteroffer of \$137,000. On October 20, the land was assessed at a value of \$98,000 for property tax purposes. On December 4, Gallatin Repair Service was offered \$160,000 for the land by a national retail chain. At what value should the land be recorded in Gallatin Repair Service's records?

Follow My Example 1-1

\$137,000. Under the cost concept, the land should be recorded at the cost to Gallatin Repair Service.

Practice Exercises: PE 1-1A, PE 1-1B

State the accounting equation and define each

element of the equation.

The Accounting Equation

The resources owned by a business are its assets. Examples of assets include cash, land, buildings, and equipment. The rights or claims to the assets are divided into two types: (1) the rights of creditors and (2) the rights of owners. The rights of creditors are the debts of the business and are called liabilities. The rights of the owners are called stockholders' equity for a corporation and owner's equity for a proprietorship, partnership, or limited liability company. Throughout this text, we use the corporate form of business. However, most of the concepts and principles described and illustrated also apply to proprietorships, partnerships, and limited liability companies.

The following equation shows the relationship among assets, liabilities, and stockholders' equity:

Assets = Liabilities + Stockholders' Equity

This equation is called the accounting equation. Liabilities usually are shown before stockholders' equity in the accounting equation because creditors have first rights to the assets.

Given any two amounts, the accounting equation may be solved for the third unknown amount. To illustrate, if the assets owned by a business amount to \$100,000 and the liabilities amount to \$30,000, the stockholders' equity is equal to \$70,000, computed as follows:

> Assets - Liabilities = Stockholders' Equity \$100,000 \$30,000 \$70,000

Business Connection



THE ACCOUNTING EQUATION

The accounting equation serves as the basic foundation for the accounting systems of all companies. From the smallest business, such as the local convenience store, to the largest business, such as The Coca-Cola Company, companies use the accounting equation. Some examples taken from recent financial reports of well-known companies follow:

Company	Assets*	=	Liabilities	+	Stockholders' Equity
The Coca-Cola Company	\$79,974	=	\$48,339	+	\$31,635
DuPont	\$49,736	=	\$39,648	+	\$10,088
eBay	\$37,074	=	\$16,209	+	\$20,865
Google	\$93,798	=	\$22,083	+	\$71,715
McDonald's	\$32,990	=	\$18,600	+	\$14,390
Microsoft Corporation	\$121,271	=	\$54,908	+	\$66,363
Southwest Airlines	\$18,596	=	\$11,604	+	\$6,992
Walmart	\$193,406	=	\$122,091	+	\$71,315
*Amounts are shown in millions of dol	lars.				

Example Exercise 1-2 Accounting Equation



You're A Star is a motivational consulting business. At the end of its accounting period, December 31, 2015, You're A Star has assets of \$800,000 and liabilities of \$350,000. Using the accounting equation, determine the following amounts:

- a. Stockholders' equity as of December 31, 2015.
- b. Stockholders' equity as of December 31, 2016, assuming that assets increased by \$130,000 and liabilities decreased by \$25,000 during 2016.

Follow My Example 1-2

a. Assets = Liabilities + Stockholders' Equity \$800,000 = \$350,000 + Stockholders' Equity

Stockholders' Equity = \$450,000

b. First, determine the change in stockholders' equity during 2016 as follows:

Assets = Liabilities + Stockholders' Equity

130,000 = -25,000 + Stockholders' Equity

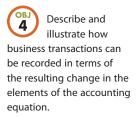
Stockholders' Equity = \$155,000

Next, add the change in stockholders' equity during 2016 to the stockholders' equity on December 31, 2015 to arrive at stockholders' equity on December 31, 2016, as follows:

.....

Stockholders' Equity on December 31, 2016 = \$450,000 + \$155,000 = \$605,000

Practice Exercises: PE 1-2A, PE 1-2B



Note:

All business transactions can be stated in terms of changes in the elements of the accounting equation.

Business Transactions and the Accounting Equation

Paying a monthly bill, such as a telephone bill of \$168, affects a business's financial condition because it now has less cash on hand. Such an economic event or condition that directly changes an entity's financial condition or its results of operations is a **business transaction**. For example, purchasing land for \$50,000 is a business transaction. In contrast, a change in a business's credit rating does not directly affect cash or any other asset, liability, or stockholders' equity amount.

All business transactions can be stated in terms of changes in the elements of the accounting equation. How business transactions affect the accounting equation can be illustrated by using some typical transactions. As a basis for illustration, a business organized by Chris Clark is used.

Assume that on November 1, 2015, Chris Clark organizes a corporation that will be known as **NetSolutions**. The first phase of Chris's business plan is to operate NetSolutions as a service business assisting individuals and small businesses in developing Web pages and installing computer software. Chris expects this initial phase of the business to last one to two years. During this period, Chris plans on gathering information on the software and hardware needs of customers. During the second phase of the business plan, Chris plans to expand NetSolutions into a personalized retailer of software and hardware for individuals and small businesses.

Each transaction during NetSolutions' first month of operations is described in the following paragraphs. The effect of each transaction on the accounting equation is then shown.

Transaction A

Nov. 1, 2015 Chris Clark deposited \$25,000 in a bank account in the name of NetSolutions in exchange for shares of common stock in the corporation.

A corporation issues **common stock** to investors as proof of their ownership rights.¹

¹To simplify, we assume that NetSolutions issued no-par stock. Types of stock as well as par and stated values are discussed in Chapter 11.

This transaction increases Cash under Assets (on the left side of the equation) by \$25,000. To balance the equation, Common Stock under Stockholders' Equity (on the right side of the equation) increases by the same amount.

The effect of this transaction on NetSolutions' accounting equation is as follows:

$$\frac{\text{Assets}}{\text{Cash}} = \begin{cases} \frac{\text{Stockholders' Equity}}{\text{Common Stock}} \\ = \frac{25,000}{\text{Common Stock}} \end{cases}$$

The preceding accounting equation is only for the business, NetSolutions. Under the business entity concept, Chris's personal assets, such as a home or personal bank account, and personal liabilities are excluded from the equation.

Nov. 5, 2015 NetSolutions paid \$20,000 for the purchase of land as a future building site.

Transaction B

The land is located in a business park with access to transportation facilities. Chris Clark plans to rent office space and equipment during the first phase of the business plan. During the second phase, Chris plans to build an office and a warehouse for NetSolutions on the land.

The purchase of the land changes the makeup of the assets, but it does not change the total assets. The items in the equation prior to this transaction and the effect of the transaction follow. The new amounts are called *balances*.

Nov. 10, 2015 NetSolutions purchased supplies for \$1,350 and agreed to pay the supplier in the near future.

Transaction C

You have probably used a credit card to buy clothing or other merchandise. In this type of transaction, you received clothing for a promise to pay your credit card bill in the future. That is, you received an asset and incurred a liability to pay a future bill. NetSolutions entered into a similar transaction by purchasing supplies for \$1,350 and agreeing to pay the supplier in the near future. This type of transaction is called a purchase *on account* and is often described as follows: *Purchased supplies on account*, \$1,350.

The liability created by a purchase on account is called an **account payable**. Items such as supplies that will be used in the business in the future are called **prepaid expenses**, which are assets. Thus, the effect of this transaction is to increase assets (Supplies) and liabilities (Accounts Payable) by \$1,350, as follows:

Nov. 18, 2015 NetSolutions received cash of \$7,500 for providing services to customers.

Transaction D

You may have earned money by painting houses or mowing lawns. If so, you received money for rendering services to a customer. Likewise, a business earns money by selling goods or services to its customers. This amount is called **revenue**.

During its first month of operations, NetSolutions received cash of \$7,500 for providing services to customers. The receipt of cash increases NetSolutions' assets and also increases stockholders' equity in the business. The revenues of \$7,500 are recorded in a Fees Earned column to the right of Common Stock. The effect of this transaction is to increase Cash and Fees Earned by \$7,500, as follows:

Different terms are used for the various types of revenues. As illustrated for NetSolutions, revenue from providing services is recorded as **fees earned**. Revenue from the sale of merchandise is recorded as **sales**. Other examples of revenue include rent, which is recorded as **rent revenue**, and interest, which is recorded as **interest revenue**.

Instead of receiving cash at the time services are provided or goods are sold, a business may accept payment at a later date. Such revenues are described as *fees earned on account* or *sales on account*. For example, if NetSolutions had provided services on account instead of for cash, transaction (d) would have been described as follows: *Fees earned on account*, \$7,500.

In such cases, the firm has an **account receivable**, which is a claim against the customer. An account receivable is an asset, and the revenue is earned and recorded as if cash had been received. When customers pay their accounts, Cash increases, and Accounts Receivable decreases.

Transaction E Nov. 30, 2015 NetSolutions paid the following expenses during the month: wages, \$2,125; rent, \$800; utilities, \$450; and miscellaneous, \$275.

During the month, NetSolutions spent cash or used up other assets in earning revenue. Assets used in this process of earning revenue are called **expenses**. Expenses include supplies used and payments for employee wages, utilities, and other services.

NetSolutions paid the following expenses during the month: wages, \$2,125; rent, \$800; utilities, \$450; and miscellaneous, \$275. Miscellaneous expenses include small amounts paid for such items as postage, coffee, and newspapers. The effect of expenses is the opposite of revenues in that expenses reduce assets and stockholders' equity. Like fees earned, the expenses are recorded in columns to the right of Common Stock. However, since expenses reduce stockholders' equity, the expenses are entered as negative amounts. The effect of this transaction is as follows:

Businesses usually record each revenue and expense transaction as it occurs. However, to simplify, NetSolutions' revenues and expenses are summarized for the month in transactions (d) and (e).

Transaction F Nov. 30, 2015 NetSolutions paid creditors on account, \$950.

When you pay your monthly credit card bill, you decrease the cash and decrease the amount you owe to the credit card company. Likewise, when NetSolutions pays \$950 to creditors during the month, it reduces assets and liabilities, as follows:

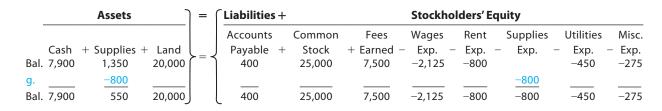
		Assets		= [Liabilities	+		Stoc	kholders	'Equity		
					Accounts		Common	Fees	Wages	Rent	Utilities	Misc.
(Cash	+ Supplies +	- Land	ل J	Payable	+	Stock	+ Earned -	- Exp.	- Exp	Exp.	Exp.
Bal. 8	3,850	1,350	20,000	(-)	1,350		25,000	7,500	-2,125	-800	-450	-275
f.	-950				-950							
Bal. 7	7,900	1,350	20,000		400		25,000	7,500	-2,125	-800	-450	-275

Paying an amount on account is different from paying an expense. The paying of an expense reduces stockholders' equity, as illustrated in transaction (e). Paying an amount on account reduces the amount owed on a liability.

Nov. 30, 2015 Chris Clark determined that the cost of supplies on hand at the end of the month was \$550.

Transaction G

The cost of the supplies on hand (not yet used) at the end of the month is \$550. Thus, \$800 (\$1,350 - \$550) of supplies must have been used during the month. This decrease in supplies is recorded as an expense, as follows:



Nov. 30, 2015 Paid dividends, \$2,000.

Transaction H

Dividends are distributions of earnings to stockholders. The payment of dividends decreases cash and stockholders' equity. Like expenses, dividends are recorded in a separate column to the right of Common Stock as a negative amount. The effect of the payment of dividends of \$2,000 is as follows.

		Assets		=	Liabilities +	+	Stockholders' Equity								
					Accounts	Common		Fees		Wages		Rent	Supplies	Utilities	Misc.
	Cash +	Supp.	+ Land	ر_ا	Payable ⊣	- Stock	- Dividends +	Earned	_	Exp.	_	Exp.	- Exp	- Exp	– Exp.
Bal.	7,900	550	20,000	$\begin{pmatrix} - \end{pmatrix}$	400	25,000		7,500		-2,125		-800	-800	-450	-275
h	-2,000						<u>-2,000</u>								
Bal.	5,900	550	20,000)	400	25,000	-2,000	7,500		-2,125		-800	-800	-450	-275

Dividends should not be confused with expenses. Dividends do not represent assets or services used in the process of earning revenues. Instead, dividends are considered a distribution of earnings to stockholders.

Summary

The transactions of **NetSolutions** are summarized in Exhibit 5. Each transaction is identified by letter, and the balance of each accounting equation element is shown after every transaction.

You should note the following:

- The effect of every transaction is an increase or a decrease in one or more of the accounting equation elements.
- The two sides of the accounting equation are always equal.
- The stockholders' equity is increased by amounts invested by stockholders (common stock).
- The stockholders' equity is increased by revenues and decreased by expenses.
- The stockholders' equity is decreased by dividends paid to stockholders.

EXHIBIT 5

Summary of Transaction for NetSolutions

		Assets	=	Liabilities +			Stockh	olders' E	quity			
				Accounts	Common		Fees	Wages	Rent	Supplies	Utilities	Misc.
	Cash	+ Supp. +	Land =	Payable +	Stock	 Dividends - 	+ Earned -	Exp	- Exp	Exp.	– Ехр	Exp.
a.	+25,000				+25,000							
b.	<u>-20,000</u>		+20,000									
Bal.	5,000		20,000		25,000							
c.		<u>+1,350</u>		+1,350								
Bal.	5,000	+1,350	20,000	+1,350	25,000							
d.	<u>+7,500</u>						+7,500					
Bal.	12,500	1,350	20,000	1,350	25,000		7,500					
e.	3,650							<u>-2,125</u>	-800		-450	-275
Bal.	8,850	1,350	20,000	1,350	25,000		7,500	-2,125	-800		-450	-275
f.	<u> </u>			950								
Bal.	7,900	1,350	20,000	400	25,000		7,500	-2,125	-800		-450	-275
g.		800								<u>-800</u>		
Bal.	7,900	550	20,000	400	25,000		7,500	-2,125	-800	-800	-450	-275
h.						<u>-2,000</u>						
Bal.	5,900	550	20,000	<u>400</u>	25,000	<u>-2,000</u>	7,500	<u>-2,125</u>	<u>-800</u>	<u>-800</u>	<u>-450</u>	-275



Classifications of Stockholders' Equity

Stockholders' equity is classified as:

- Common Stock
- Retained Earnings.

Common stock is shares of ownership distributed to investors of a corporation. It represents the portion of stockholders' equity contributed by investors. For **NetSolutions**, shares of common stock of \$25,000 were distributed to Chris Clark in exchange for investing in the business.

Retained earnings is the stockholders' equity created from business operations through revenue and expense transactions. For NetSolutions, retained earnings of \$3,050 were created by its November operations (revenue and expense transactions), computed as follows:

NetSolutions Retained Earnings November Operations (Revenue and Expense Transactions)

	, construction and any of the construction of										
	Fees Earned	Wages Exp.	Rent Exp.	Supplies Exp.	Utilities _ Exp.	Misc.					
	carrieu	Exp.	Exp.	Exp.	Exp.	Exp.					
Trans, d.	+7,500										
Trans, e.		-2,125	-800		-450	-275					
Trans, g.				-800							
Balance, Nov. 30	7,500	-2,125	-800	-800	-450	-275					
			\$3	,050							

Stockholders' equity created by investments by stockholders (common stock) and by business operations (retained earnings) are reported separately. Since dividends are distributions of earnings to stockholders, dividends reduce retained earnings. NetSolutions paid \$2,000 in dividends during November, thus reducing retained earnings to \$1,050 (\$3,050 – \$2,000).

The effects of investments by stockholders, dividends, revenues, and expenses on stockholders' equity are illustrated in Exhibit 6.

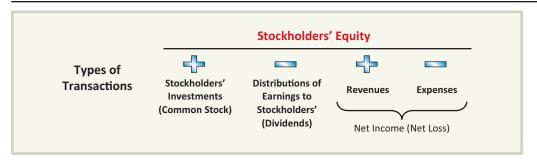


EXHIBIT 6

Effects of Transactions on Stockholders' Equity



Example Exercise 1-3 Transactions



The following selected transactions were completed by Salvo Delivery Service during February:

- 1. Received cash from owner as additional investment in exchange for common stock, \$35,000.
- 2. Paid creditors on account, \$1,800.
- 3. Billed customers for delivery services on account, \$11,250.
- 4. Received cash from customers on account, \$6,740.
- 5. Paid dividends, \$1,000.

Indicate the effect of each transaction on the following accounting equation elements: Assets, Liabilities, Common Stock, Dividends, Revenue, and Expense. To illustrate, the answer to (1) follows:

(1) Asset (Cash) increases by \$35,000; Common Stock increases by \$35,000.

Follow My Example 1-3

- (2) Asset (Cash) decreases by \$1,800; Liability (Accounts Payable) decreases by \$1,800.
- (3) Asset (Accounts Receivable) increases by \$11,250; Revenue (Delivery Service Fees) increases by \$11,250.
- (4) Asset (Cash) increases by \$6,740; Asset (Accounts Receivable) decreases by \$6,740.
- (5) Asset (Cash) decreases by \$1,000; Dividends increases by \$1,000.

Practice Exercises: PE 1-3A, PE 1-3B

Financial Statements

Describe the financial statements of a corporation and explain how they interrelate.

After transactions have been recorded and summarized, reports are prepared for users. The accounting reports providing this information are called **financial statements**. The primary financial statements of a corporation are the income statement, the retained earnings statement, the balance sheet, and the statement of cash flows. The order in which the financial statements are prepared and the nature of each statement are described in Exhibit 7.

Order Prepared	Financial Statement	Description of Statement
1.	Income statement	A summary of the revenue and expenses for a specific period of time, such as a month or a year.
2.	Retained earnings statement	A summary of the changes in the retained earnings that have occurred <i>during a specific period of time</i> , such as a month or a year.
3.	Balance sheet	A list of the assets, liabilities, and stockholders' equity as of a specific date, usually at the close of the last day of a month or a year.
4.	Statement of cash flows	A summary of the cash receipts and cash payments for a specific period of time, such as a month or a year.

EXHIBIT 7

Financial Statements The four financial statements and their interrelationships are illustrated in Exhibit 8, The data for the statements are taken from the summary of **NetSolutions**' transactions in Exhibit 5.

All financial statements are identified by the name of the business, the title of the statement, and the *date* or *period of time*. The data presented in the income statement, the retained earnings statement, and the statement of cash flows are for a period of time. The data presented in the balance sheet are for a specific date.

Income Statement

Note:

When revenues exceed expenses, it is referred to as net income, net profit, or earnings. When expenses exceed revenues, it is referred to as net loss.

The income statement reports the revenues and expenses for a period of time, based on the **matching concept**. This concept is applied by *matching* the expenses incurred during a period with the revenue that those expenses generated. The excess of the revenue over the expenses is called **net income**, **net profit**, or **earnings**. If the expenses exceed the revenue, the excess is a **net loss**.

The revenue and expenses for **NetSolutions** were shown in the equation as separate increases and decreases. Net income for a period increases the stockholders' equity (retained earnings) for the period. A net loss decreases the stockholders' equity (retained earnings) for the period.

The revenue, expenses, and the net income of \$3,050 for NetSolutions are reported in the income statement in Exhibit 8. The order in which the expenses are listed in the income statement varies among businesses. Most businesses list expenses in order of size, beginning with the larger items. Miscellaneous expense is usually shown as the last item, regardless of the amount.





The revenues and expenses of Chickadee Travel Service for the year ended April 30, 2016, follow:

Fees earned	\$263,200
Miscellaneous expense	12,950
Office expense	63,000
Wages expense	131,700

Prepare an income statement for the year ended April 30, 2016.

Follow My Example 1-4

Chickadee Travel Service Income Statement For the Year Ended April 30, 2016

Fees earned\$263,2	
Expenses:	
Wages expense\$131,700	
Office expense	
Miscellaneous expense 12,950	
Total expenses 207,6	550
Net income	550

Practice Exercises: PE 1-4A, PE 1-4B

Retained Earnings Statement

The retained earnings statement reports the changes in the retained earnings for a period of time. It is prepared *after* the income statement because the net income or net loss for the period must be reported in this statement. Similarly, it is prepared *before* the balance sheet, since the amount of retained earnings at the end of the period must be reported

on the balance sheet. Because of this, the retained earnings statement is often viewed as the connecting link between the income statement and balance sheet.

The following two types of transactions affected NetSolutions' retained earnings during November:

- Revenues and expenses, which resulted in net income of \$3,050.
- Dividends of \$2,000 paid to stockholders (Chris Clark).

These transactions are summarized in the retained earnings statement for **NetSolutions** shown in Exhibit 6.

Since NetSolutions has been in operation for only one month, it has no retained earnings at the beginning of November. For December, however, there is a beginning balance—the balance at the end of November. This balance of \$1,050 is reported on the retained earnings statement.

To illustrate, assume that NetSolutions earned net income of \$4,155 and paid dividends of \$2,000 during December. The retained earnings statement for NetSolutions for December follows:

NetSolutions Retained Earnings Statement For the Month Ended December 31, 2015

Retained earnings, December 1, 2015		\$1,050
Net income for November	\$4,155	
Less dividends	2,000	
Increase in retained earnings		2,155
Retained earnings, December 31, 2015		\$3,205

Example Exercise 1-5 Retained Earnings Statement



Using the income statement for Chickadee Travel Service shown in Example Exercise 1-4, prepare a retained earnings statement for the year ended April 30, 2016. Adam Cellini invested an additional \$50,000 in the business in exchange for common stock, and dividends of \$30,000 were paid during the year. Retained earnings were \$30,000 on May 1, 2015, the beginning of the current year.

Follow My Example 1-5

Chickadee Travel Service Retained Earnings Statement For the Year Ended April 30, 2016

Retained earnings, May 1, 2015		\$30,000
Net income for the year	\$55,550	
Less dividends	30,000	
Increase in retained earnings		25,550
Retained earnings, April 30, 2016		\$55,550
		-,-

Practice Exercises: PE 1-5A, PE 1-5B

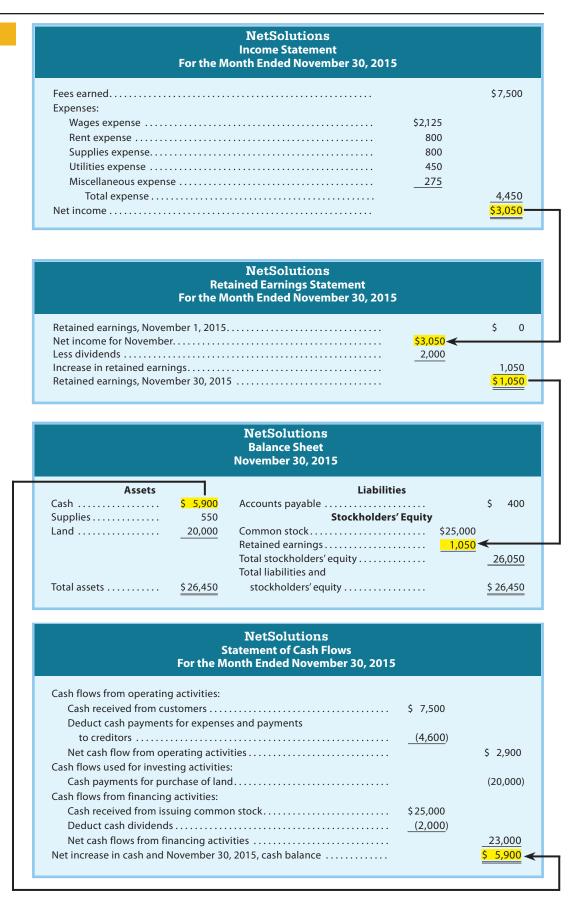
Balance Sheet

The balance sheet in Exhibit 8 reports the amounts of **NetSolutions**' assets, liabilities, and stockholders' equity as of November 30, 2015. The asset and liability amounts are taken from the last line of the summary of transactions in Exhibit 5. Retained earnings as of November 30, 2015, is taken from the retained earnings statement. The form of balance sheet shown in Exhibit 8 is called the **account form**.

EXHIBIT 8

Financial
Statements for
NetSolutions





This is because it resembles the basic format of the accounting equation, with assets on the left side and the liabilities and stockholders' equity sections on the right side.³

The assets section of the balance sheet presents assets in the order that they will be converted into cash or used in operations. Cash is presented first, followed by receivables, supplies, prepaid insurance, and other assets. The assets of a more permanent nature are shown next, such as land, buildings, and equipment.

In the liabilities section of the balance sheet in Exhibit 8, accounts payable is the only liability. When there are two or more liabilities, each should be listed and the total amount of liabilities presented as follows:

E A

Bank loan officers use a business's financial statements

in deciding whether to grant a loan to the business. Once the loan is granted, the borrower may be required to maintain a certain level of assets in excess of liabilities. The business's financial statements are used to monitor this level.

Liabilities

Accounts payable \$12,900 Wages payable 2,570

Total liabilities \$15,470

Example Exercise 1-6 Balance Sheet

Using the following data for Chickadee Travel Service as well as the retained earnings statement shown in Example Exercise 1-5, prepare a balance sheet as of April 30, 2016.

 Accounts payable
 \$12,200

 Accounts receivable
 31,350

 Cash
 53,050

 Common stock
 100,000

 Land
 80,000

 Supplies
 3,350

Follow My Example 1-6

Chickadee Travel Service Balance Sheet April 30, 2016

Assets		Liabilities		
Cash	\$ 53,050	Accounts payable		\$ 12,200
Accounts receivable	31,350	Stockholders' Equity		
Supplies	3,350	Common stock	\$100,000	
Land	80,000	Retained earnings	55,550	
		Total stockholders' equity		155,550
Total assets	\$167,750	Total liabilities and stockholders' equity		\$167,750

Practice Exercises: PE 1-6A, PE 1-6B

Statement of Cash Flows

The statement of cash flows consists of the following three sections, as shown in Exhibit 8:

- 1. operating activities
- 2. investing activities
- 3. financing activities

Each of these sections is briefly described in this section.

Cash Flows from Operating Activities This section reports a summary of cash receipts and cash payments from operations. The net cash flow from operating activities normally differs from the amount of net income for the period. In Exhibit 8, **Net-Solutions** reported net cash flows from operating activities of \$2,900 and net income

³ An alternative form of balance sheet, called the *report form,* is illustrated in Chapter 5. It presents the liabilities and stockholders' equity sections below the assets section.

of \$3,050. This difference occurs because revenues and expenses may not be recorded at the same time that cash is received from customers or paid to creditors.

Cash Flows from Investing Activities This section reports the cash transactions for the acquisition and sale of relatively permanent assets. Exhibit 8 reports that **NetSolutions** paid \$20,000 for the purchase of land during November.

Cash Flows from Financing Activities This section reports the cash transactions related to cash investments by stockholders, borrowings, and dividends. Exhibit 8 shows that Chris Clark invested \$25,000 in exchange for common stock of **NetSolutions**. NetSolutions also paid \$2,000 of dividends during November.

Preparing NetSolutions' Statement of Cash Flows Preparing the statement of cash flows requires that each of the November cash transactions for **NetSolutions** be classified as an operating, investing, or financing activity. Using the summary of transactions shown in Exhibit 5, the November cash transactions for NetSolutions are classified as follows:

Transaction	Amount	Cash Flow Activity
a.	\$25,000	Financing (Issued common stock)
b.	-20,000	Investing (Purchase of land)
d.	7,500	Operating (Fees earned)
e.	-3,650	Operating (Payment of expenses)
f.	-950	Operating (Payment of account payable)
h.	-2,000	Financing (Paid dividends)

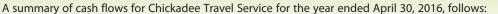
Transactions (c) and (g) are not listed since they did not involve a cash receipt or payment. In addition, the payment of accounts payable in transaction (f) is classified as an operating activity because the account payable arose from the purchase of supplies, which are used in operations. Using the preceding classifications of November cash transactions, the statement of cash flows is prepared as shown in Exhibit 8.⁴

The ending cash balance shown on the statement of cash flows is also reported on the balance sheet as of the end of the period. To illustrate, the ending cash of \$5,900 reported on the November statement of cash flows in Exhibit 8 is also reported as the amount of cash on hand in the November 30, 2015, balance sheet.

Since November is NetSolutions' first period of operations, the net cash flow for November and the November 30, 2015, cash balance are the same amount, \$5,900, as shown in Exhibit 8. In later periods, NetSolutions will report in its statement of cash flows a beginning cash balance, an increase or a decrease in cash for the period, and an ending cash balance. For example, assume that for December NetSolutions has a decrease in cash of \$3,835. The last three lines of NetSolutions' statement of cash flows for December would be as follows:

Decrease in cash	\$(3,835)
Cash as of December 1, 2015	5,900
Cash as of December 31, 2015	\$ 2,065

Example Exercise 1-7 Statement of Cash Flows



Cash receipts:	
Cash received from customers	\$251,000
Cash received from issuing common stock	50,000
Cash payments:	
Cash paid for expenses	210,000
Cash paid for land	80,000
Cash paid as dividends	30,000

The cash balance as of May 1, 2015, was \$72,050. Prepare a statement of cash flows for Chickadee Travel Service for the year ended April 30, 2016.

(Continued)

⁴This method of preparing the statement of cash flows is called the "direct method." This method and the indirect method are discussed further in Chapter 14.

Follow My Example 1-7		
Chickadee Travel Service Statement of Cash Flows For the Year Ended April 30, 2016		
Cash flows from operating activities:		
Cash received from customers	\$ 251,000	
Deduct cash payments for expenses	(210,000)	
Net cash flows from operating activities		\$ 41,000
Cash flows from investing activities:		
Cash payments for purchase of land		(80,000)
Cash flows from financing activities:		
Cash received from issuing common stock	\$ 50,000	
Deduct cash dividends	(30,000)	
Net cash flows from financing activities		20,000
Net decrease in cash during year		\$(19,000)
Cash as of May 1, 2015		72,050
Cash as of April 30, 2016		\$ 53,050
Cash as 61 / pm 36, 2010		- 33,030

Practice Exercises: PE 1-7A, PE 1-7B

Interrelationships Among Financial Statements

Financial statements are prepared in the order of the income statement, retained earnings statement, balance sheet, and statement of cash flows. This order is important because the financial statements are interrelated. These interrelationships for **NetSolutions** are shown in Exhibit 8 and are described in Exhibit 9.⁵

Financial Statement Interrelationships

Financial Statements	Interrelationship	NetSolutions Example (Exhibit 8)
Income Statement and Retained Earnings Statement	Net income or net loss reported on the income statement is also reported on the retained earnings statement as either an addition (net income) to or deduction (net loss) from the beginning retained earnings.	NetSolutions' net income of \$3,050 for November is added to the beginning retained earnings on November 1, 2015, on the retained earnings statement.
Retained Earnings Statement <i>and</i> Bal- ance Sheet	Retained earnings at the end of the period reported on the retained earnings statement is also reported on the balance sheet as retained earnings.	NetSolutions' retained earnings of \$1,050 as of November 30, 2015, on the retained earnings statement also appears on the November 30, 2015, balance sheet as retained earnings.
Balance Sheet <i>and</i> Statement of Cash Flows	The cash reported on the balance sheet is also reported as the end-of-period cash on the statement of cash flows.	Cash of \$5,900 reported on the balance sheet as of November 30, 2015, is also reported on the November statement of cash flows as the end-of-period cash.

The preceding interrelationships are important in analyzing financial statements and the impact of transactions on a business. In addition, these interrelationships serve as a check on whether the financial statements are prepared correctly. For example, if the ending cash on the statement of cash flows does not agree with the balance sheet cash, then an error has occurred.

⁵ Depending on the method of preparing the cash flows from operating activities section of the statement of cash flows, net income (or net loss) may also appear on the statement of cash flows. This interrelationship or method of preparing the statement of cash flows, called the "indirect method," is described and illustrated in Chapter 14.





Financial Analysis and Interpretation: Ratio of Liabilities to Stockholders' Equity

The basic financial statements illustrated in this chapter are useful to bankers, creditors, stockholders, and others in analyzing and interpreting the financial performance and condition of a company. Throughout this text, various tools and techniques that are often used to analyze and interpret a company's financial performance and condition are described and illustrated. The first such tool that is discussed is useful in analyzing the ability of a company to pay its creditors.

The relationship between liabilities and stockholders' equity, expressed as a **ratio of liabilities to stockholders' equity**, is computed as follows:

$$\begin{array}{ll} \mbox{Ratio of Liabilities to} \\ \mbox{Stockholders' Equity} \end{array} = \frac{\mbox{Total Liabilities}}{\mbox{Total Stockholders' Equity}} \end{array}$$

NetSolutions' ratio of liabilities to stockholders' equity at the end of November is 0.015, computed as follows:

Ratio of Liabilities to Stockholders' Equity
$$=$$
 $\frac{$400}{$26,050} = 0.015$ (Rounded)

To illustrate, recent balance sheet data (in millions) for Google Inc. and McDonald's Corporation follows:

	Recent	Prior
	Year	Year
Google Inc.		
Total liabilities	\$22,083	\$14,429
Total stockholders' equity	71,715	58,145
McDonald's Corporation		
Total liabilities	\$18,600	\$17,341
Total stockholders' equity	14,390	14,634

The ratio of liabilities to stockholders' equity for Google and McDonald's for a recent year and the prior year is computed as follows:

	Recent	Prior
	Year*	Year*
Google Inc.		
Ratio of liabilities to stockholders' equity	0.31	0.25
	(\$22,083 ÷ \$71,715)	(\$14,429 ÷ \$58,145)
McDonald's Corporation		
Ratio of liabilities to stockholders' equity	1.29	1.18
	(\$18,600 ÷ \$14,390)	(\$17,341 ÷ \$14,634)

^{*} Rounded to two decimal places.

The rights of creditors to a business's assets come before the rights of stockholders. Thus, the lower the ratio of liabilities to stockholders' equity, the better able the company is to withstand poor business conditions and to pay its obligations to creditors.

Google is unusual in that it has a very low amount of liabilities. Its ratio of liabilities to stockholders' equity of 0.31 in the recent year and 0.25 in the prior year is low. In contrast, McDonald's has more liabilities; its ratio of liabilities to stockholders' equity is 1.29 in the recent year and 1.18 in the prior year. Because McDonald's ratio of liabilities to stockholders' equity increased slightly, its creditors are slightly more at risk at the end of the recent year. Also, McDonald's creditors are more at risk than are Google's creditors. As well-established companies, however, the creditors of both companies are protected against the risk of nonpayment.

Example Exercise 1-8 Ratio of Liabilities to Stockholders' Equity

OBJ 6

The following data were taken from Hawthorne Company's balance sheet:

	Dec. 31, 2016	Dec. 31, 2015
Total liabilities	\$120,000	\$105,000
Total stockholders' equity	80,000	75,000

- a. Compute the ratio of liabilities to stockholders' equity.
- b. Has the creditors' risk increased or decreased from December 31, 2015, to December 31, 2016?

Follow My Example 1-8

a.	Dec. 31, 2016	Dec. 31, 2015
Total liabilities	\$120,000	\$105,000
Total stockholders' equity	80,000	75,000
Ratio of liabilities to stockholders' equity	1.50	1.40
	(\$120,000 ÷ \$80,000)	(\$105,000 ÷ \$75,000)

b. Increased

Practice Exercises: PE 1-8A, PE 1-8B

At a Glance 1



Describe the nature of a business and the role of accounting and ethics in business.

Key Points A business provides goods or services (outputs) to customers with the objective of earning a profit. Three types of businesses include service, merchandising, and manufacturing businesses.

Accounting is an information system that provides reports to users about the economic activities and condition of a business.

Ethics are moral principles that guide the conduct of individuals. Good ethical conduct depends on individual character and firm culture.

Accountants are engaged in private accounting or public accounting.

Learning Outcomes	Example Exercises	Practice Exercises
 Distinguish among service, merchandising, and manufacturing businesses. 		
 Describe the role of accounting in business, and explain why accounting is called the "language of business." 		
• Define ethics, and list two factors affecting ethical conduct.		
Differentiate between private and public accounting.		



Summarize the development of accounting principles and relate them to practice.

Key Points Generally accepted accounting principles (GAAP) are used in preparing financial statements. Accounting principles and concepts develop from research, practice, and pronouncements of authoritative bodies. The business entity concept views the business as an entity separate from its owners, creditors, or other businesses. Businesses may be organized as proprietorships, partnerships, corporations, and limited liability companies. The cost concept requires that purchases by a business be recorded in terms of actual cost. The objectivity concept requires that the accounting records and reports be based on objective evidence. The unit of measure concept requires that economic data be recorded in dollars.

Learning Outcomes	Example Exercises	Practice Exercises
 Explain what is meant by generally accepted accounting principles. 		
 Describe how generally accepted accounting principles are developed. 		
• Describe and give an example of what is meant by the business entity concept.		
 Describe the characteristics of a proprietorship, partnership, corporation, and limited liability company. 		
 Describe and give an example of what is meant by the cost concept. 	EE1-1	PE1-1A, 1-1B
 Describe and give an example of what is meant by the objectivity concept. 		
 Describe and give an example of what is meant by the unit of measure concept. 		



State the accounting equation and define each element of the equation.

Key Points The resources owned by a business and the rights or claims to these resources may be stated in the form of an equation, as follows: Assets = Liabilities + Stockholders' Equity

Learning Outcomes	Example Exercises	Practice Exercises
• State the accounting equation.		
• Define assets, liabilities, and stockholders' equity.		
• Given two elements of the accounting equation, solve for the third element.	EE1-2	PE1-2A, 1-2B



Describe and illustrate how business transactions can be recorded in terms of the resulting change in the elements of the accounting equation.

Key Points All business transactions can be stated in terms of the change in one or more of the three elements of the accounting equation.

Learning Outcomes	Example Exercises	Practice Exercises
• Define a business transaction.		
 Using the accounting equation as a framework, record transactions. 	EE1-3	PE1-3A, 1-3B



Describe the financial statements of a corporation and explain how they interrelate.

Key Points The primary financial statements of a corporation are the income statement, the retained earnings statement, the balance sheet, and the statement of cash flows. The income statement reports a period's net income or net loss, which is also reported on the retained earnings statement. The ending retained earnings reported on the retained earnings statement is also reported on the balance sheet. The ending cash balance is reported on the balance sheet and the statement of cash flows.

Learning Outcomes	Example Exercises	Practice Exercises
 List and describe the financial statements of a corporation. 		
• Prepare an income statement.	EE1-4	PE1-4A, 1-4B
• Prepare a retained earnings statement.	EE1-5	PE1-5A, 1-5B
• Prepare a balance sheet.	EE1-6	PE1-6A, 1-6B
• Prepare a statement of cash flows.	EE1-7	PE1-7A, 1-7B
 Explain how the financial statements of a corporation are interrelated. 		



Describe and illustrate the use of the ratio of liabilities to stockholders' equity in evaluating a company's financial condition.

Key Points A ratio useful in analyzing the ability of a business to pay its creditors is the ratio of liabilities to stockholders' equity. The lower the ratio of liabilities to stockholders' equity, the better able the company is to withstand poor business conditions and to pay its obligations to creditors.

Learning Outcomes	Example Exercises	Practice Exercises	
 Describe the usefulness of the ratio of liabilities to stockholders' equity. 			
• Compute the ratio of liabilities to stockholders' equity.	EE1-8	PE1-8A, 1-8B	

Key Terms

account form (17)
account payable (11)
account receivable (12)
accounting (3)
accounting equation (9)
assets (9)
balance sheet (15)
business (2)
business entity concept (7)
business transaction (10)
Certified Public Accountant
(CPA) (5)
common stock (10)

corporation (8)
cost concept (8)
dividends (13)
earnings (16)
ethics (4)
expenses (12)
fees earned (12)
financial accounting (4)
Financial Accounting Standards
Board (FASB) (7)
financial statements (15)
generally accepted accounting
principles (GAAP) (7)

general-purpose financial statements (4)
income statement (15)
interest revenue (12)
International Accounting Standards Board (IASB) (7)
liabilities (9)
limited liability company (LLC) (8)
management (or managerial) accounting (3)
manufacturing business (3)
matching concept (16)
merchandising business (2)

net income (or net profit) (16) net loss (16) objectivity concept (8) owner's equity (9) partnership (8) prepaid expenses (11) private accounting (3) profit (2) proprietorship (8) public accounting (5)
Public Company Accounting
Oversight Board (PCAOB) (5)
ratio of liabilities to stockholders'
equity (22)
rent revenue (12)
retained earnings (14)
retained earnings statement (15)
revenue (11)

sales (12)
Sarbanes-Oxley Act (SOX) (5)
Securities and Exchange
Commission (SEC) (7)
service business (2)
statement of cash flows (15)
stockholders' equity (9)
unit of measure concept (8)

Illustrative Problem

Cecil Jameson, Attorney-at-Law, is organized as a corporation and operated by Cecil Jameson. On July 1, 2015, the company has the following assets, liabilities, and common stock: cash, \$1,000; accounts receivable, \$3,200; supplies, \$850; land, \$10,000; accounts payable, \$1,530; common stock, \$10,000. Office space and office equipment are currently being rented, pending the construction of an office complex on land purchased last year. Business transactions during July are summarized as follows:

- a. Received cash from clients for services, \$3,928.
- b. Paid creditors on account, \$1,055.
- c. Received cash from Cecil Jameson as an additional investment in exchange for common stock, \$3,700.
- d. Paid office rent for the month, \$1,200.
- e. Charged clients for legal services on account, \$2,025.
- f. Purchased supplies on account, \$245.
- g. Received cash from clients on account, \$3,000.
- h. Received invoice for paralegal services from Legal Aid Inc. for July (to be paid on August 10), \$1,635.
- i. Paid the following: wages expense, \$850; utilities expense, \$325; answering service expense, \$250; and miscellaneous expense, \$75.
- j. Determined that the cost of supplies on hand was \$980; therefore, the cost of supplies used during the month was \$115.
- k. Paid dividends, \$1,000.

Instructions

- 1. Determine the amount of retained earnings as of July 1, 2015.
- 2. State the assets, liabilities, and stockholders' equity as of July 1 in equation form similar to that shown in this chapter. In tabular form below the equation, indicate the increases and decreases resulting from each transaction and the new balances after each transaction.
- 3. Prepare an income statement for July, a retained earnings statement for July, and a balance sheet as of July 31, 2015.
- 4. (Optional) Prepare a statement of cash flows for July.

Solution

1.

```
Assets – Liabilities = Stockholders' Equity

($1,000 + $3,200 + $850 + $10,000) - $1,530 = Common Stock + Retained Earnings

$15,050 - $1,530 = $10,000 + Retained Earnings

$3,520 = Retained Earnings
```

		Assets		=	Liabilitie	es +	Stockholders' Equity									
														Answering		
		Accts.			Accts		Retained	Fee		Paralegal			Utilities	Service	Supp.	
ъ.	Cash +	Rec. +		Land =	Pay. +			Dividends + Earr	ned -	– Exp. –	Exp. –	Exp. –	Exp. –	Exp.	– Exp	- Exp.
	1,000	3,200	850	10,000	1,530	10,000	3,520	3.0	928							
	+3,928 4,928	3,200	850	10,000	1,530	10,000	3,520		928							
	-1,055	3,200	630	10,000	-1,055	10,000	3,320	٥,:	920							
	3,873	3,200	850	10,000	475	10,000	3,520	3.9	928							
	+3,700	-,		,		+3,700	-,	-,-								
Bal.	7,573	3,200	850	10,000	475	13,700	3,520	3,9	928							
d.	-1,200										<u>-1,200</u>					
Bal.	6,373	3,200	850	10,000	475	13,700	3,520	3,9	928		-1,200					
e.		+ 2,025						+ 2,0	025							
	6,373	5,225	850	10,000	475	13,700	3,520	5,9	953		-1,200					
f.			+245		+245											
	6,373	5,225	1,095	10,000	720	13,700	3,520	5,9	953		-1,200					
g.	+3,000	-3,000														
Bal.	9,373	2,225	1,095	10,000	720	13,700	3,520	5,9	953		-1,200					
h.					+1,635					-1,635						
Bal.	9,373	2,225	1,095	10,000	2,355	13,700	3,520	5,9	953	-1,635	-1,200					
i.	-1,500											-850	-325	-250		-75
Bal.	7,873	2,225	1,095	10,000	2,355	13,700	3,520	5,9	953	-1,635	-1,200	-850	-325	-250		-75
j.			115												<u>-115</u>	
	7,873	2,225	980	10,000	2,355	13,700	3,520	•	953	-1,635	-1,200	-850	-325	-250	-115	- 75
Bal.	6,873	2,225	980	10,000	2,355	13,700	3,520	_1,000	953	-1,635 	-1,200	-850	-325	-250	-115	-75

3.

Cecil Jameson, Attorney-at-Law Income Statement For the Month Ended July 31, 2015		
Fees earned.		\$5,953
Expenses:		
Paralegal expense	\$1,635	
Rent expense	1,200	
Wages expense	850	
Utilities expense	325	
Answering service expense	250	
Supplies expense	115	
Miscellaneous expense	75	
Total expenses		4,450
Net income		\$1,503

Cecil Jameson, Attorney-at-Law Retained Earnings Statement For the Month Ended July 31, 2015		
Retained earnings, July 1, 2015 Net income for the month Less dividends Increase in retained earnings Retained earnings, July 31, 2015	\$1,503 	\$3,520 <u>503</u>

(Continued)

Cecil Jameson, Attorney-at-Law Balance Sheet July 31, 2015							
Assets		Liabilities					
Cash	\$ 6,873	Accounts payable \$ 2,355					
Accounts receivable	2,225	Stockholders' Equity					
Supplies	980	Common stock					
Land	10,000	Retained earnings 4,023					
		Total stockholders' equity					
		Total liabilities and stockholders'					
Total assets	\$20,078	equity <u>\$20,078</u>					

4. (Optional)

Cecil Jameson, Attorney-at-Law Statement of Cash Flows For the Month Ended July 31, 2015		
Cash flows from operating activities: Cash received from customers Deduct cash payments for operating expenses Net cash flows from operating activities Cash flows from investing activities. Cash flows from financing activities: Cash received from issuing common stock Deduct cash dividends Net cash flows from financing activities.	\$ 6,928* (3,755)** \$ 3,700 (1,000)	\$ 3,173 — 2,700
Net increase in cash during year Cash as of July 1, 2015 Cash as of July 31, 2015 *\$6,928 = \$3,928 + \$3,000 **\$3,755 = \$1,055 + \$1,200 + \$1,500		\$ 5,873 1,000 \$ 6,873

Discussion Questions

- 1. Name some users of accounting information.
- 2. What is the role of accounting in business?
- Why are most large companies like Microsoft, PepsiCo, Caterpillar, and AutoZone organized as corporations?
- 4. Josh Reilly is the owner of Dispatch Delivery Service. Recently Josh paid interest of \$4,500 on a personal loan of \$75,000 that he used to begin the business. Should Dispatch Delivery Service record the interest payment? Explain.
- 5. On July 12, Reliable Repair Service extended an offer of \$150,000 for land that had been priced for sale at \$185,000. On September 3, Reliable Repair Service accepted the seller's counteroffer of \$167,500. Describe how Reliable Repair Service should record the land.
- 6. a. Land with an assessed value of \$750,000 for property tax purposes is acquired by a business for \$900,000. Ten years later, the plot of land has an assessed value of \$1,200,000 and the business receives an offer of \$2,000,000 for it. Should the monetary amount assigned to the land in the business records now be increased?
 - b. Assuming that the land acquired in (a) was sold for \$2,125,000, how would the various elements of the accounting equation be affected?
- Describe the difference between an account receivable and an account payable.
- 8. A business had revenues of \$679,000 and operating expenses of \$588,000. Did the business (a) incur a net loss or (b) realize net income?

- 9. A business had revenues of \$640,000 and operating expenses of \$715,000. Did the business (a) incur a net loss or (b) realize net income?
- 10. The financial statements are interrelated. (a) What item of financial or operating data appears on

both the income statement and the retained earnings statement? (b) What item appears on both the balance sheet and the retained earnings statement? (c) What item appears on both the balance sheet and the statement of cash flows?

Practice Exercises

PE 1-1A Cost concept

OBJ. 2



On February 22, Kountry Repair Service extended an offer of \$200,000 for land that had been priced for sale at \$250,000. On April 3, Kountry Repair Service accepted the seller's counteroffer of \$230,000. On September 15, the land was assessed at a value of \$185,000 for property tax purposes. On January 9 of the next year, Kountry Repair Service was offered \$300,000 for the land by a national retail chain. At what value should the land be recorded in Kountry Repair Service's records?

EE 1-1 p. 9 PE 1-1B Cost concept

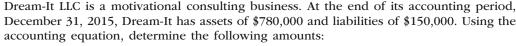
OBJ. 2



On March 31, Higgins Repair Service extended an offer of \$415,000 for land that had been priced for sale at \$460,000. On April 15, Higgins Repair Service accepted the seller's counteroffer of \$437,500. On September 9, the land was assessed at a value of \$375,000 for property tax purposes. On December 8, Higgins Repair Service was offered \$475,000 for the land by a national retail chain. At what value should the land be recorded in Higgins Repair Service's records?

PE 1-2A Accounting equation **EE 1-2** p. 10

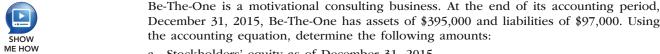
OBJ. 3



- a. Stockholders' equity as of December 31, 2015.
- b. Stockholders' equity as of December 31, 2016, assuming that assets increased by \$90,000 and liabilities increased by \$25,000 during 2016.

PE 1-2B Accounting equation

OBJ. 3



- December 31, 2015, Be-The-One has assets of \$395,000 and liabilities of \$97,000. Using the accounting equation, determine the following amounts:
- a. Stockholders' equity as of December 31, 2015.
- b. Stockholders' equity as of December 31, 2016, assuming that assets decreased by \$65,000 and liabilities increased by \$36,000 during 2016.

EE 1-3 p. 15 PE 1-3A Transactions

Arrowhead Delivery Service is owned and operated by Gates Deeter. The following selected transactions were completed by Arrowhead Delivery Service during August:

- 1. Received cash in exchange for common stock, \$25,000.
- 2. Paid creditors on account, \$3,750.

(Continued)



- 3. Billed customers for delivery services on account, \$22,400.
- 4. Received cash from customers on account, \$11,300.
- 5. Paid dividends, \$6,000.

Indicate the effect of each transaction on the following accounting equation elements: Assets, Liabilities, Common Stock, Dividends, Revenue, and Expense. To illustrate, the answer to (1) follows:

(1) Asset (Cash) increases by \$25,000; Common Stock increases by \$25,000.

EE 1-3 p. 15 PE 1-3B Transactions

OBJ. 4

Interstate Delivery Service is owned and operated by Katie Wyer. The following selected transactions were completed by Interstate Delivery Service during May:

- 1. Received cash in exchange for common stock, \$18,000.
- 2. Paid advertising expense, \$4,850.
- 3. Purchased supplies on account, \$2,100.
- 4. Billed customers for delivery services on account, \$14,700.
- 5. Received cash from customers on account, \$8,200.

Indicate the effect of each transaction on the following accounting equation elements: Assets, Liabilities, Common Stock, Dividends, Revenue, and Expense. To illustrate, the answer to (1) follows:

(1) Asset (Cash) increases by \$18,000; Common Stock increases by \$18,000.

EE 1-4 p. 16 PE 1-4A Income statement

OBJ. 5

The revenues and expenses of Ousel Travel Service for the year ended November 30, 2016. follow:

Fees earned	\$1,475,000
Office expense	320,000
Miscellaneous expense	28,000
Wages expense	885,000

Prepare an income statement for the year ended November 30, 2016.

EE 1-4 p. 16 PE 1-4B Income statement

OBJ. 5

The revenues and expenses of Sentinel Travel Service for the year ended August 31, 2016, follow:

Fees earned	\$750,000
Office expense	295,000
Miscellaneous expense	12,000
Wages expense	450,000

Prepare an income statement for the year ended August 31, 2016.

EE 1-5 p. 17 PE 1-5A Retained Earnings Statement

OBJ. 5



Using the income statement for Ousel Travel Service shown in Practice Exercise 1-4A, prepare a retained earnings statement for the year ended November 30, 2016. Shane Ousel invested an additional \$50,000 in the business in exchange for common stock during the year and cash dividends of \$30,000 were paid. Retained earnings as of December 1, 2015, was \$566,000.



PE 1-5B Retained earnings statement

OBJ. 5



Using the income statement for Sentinel Travel Service shown in Practice Exercise 1-4B, prepare a retained earnings statement for the year ended August 31, 2016. Barb Schroeder invested an additional \$36,000 in the business in exchange for common stock, and \$18,000 of dividends were paid during the year. Retained earnings as of September 1, 2015, were \$300,000.

PE 1-6A Balance sheet **EE 1-6** p. 19

OBJ. 5

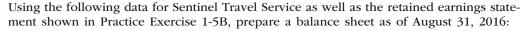


Using the following data for Ousel Travel Service as well as the retained earnings statement shown in Practice Exercise 1-5A, prepare a balance sheet as of November 30, 2016:

Accounts payable	\$ 62,500
Accounts receivable	186,000
Cash	308,000
Land	480,000
Supplies	16,500

PE 1-6B Balance sheet **EE 1-6** *p. 19*

OBJ. 5



Accounts payable	\$ 44,600
Accounts receivable	75,500
Cash	45,400
Land	310,000
Supplies	4,700

PE 1-7A Statement of cash flows **EE 1-7** p. 20

OBJ. 5



A summary of cash flows for Ousel Travel Service for the year ended November 30, 2016, follows:

(ash	receipts:

Cash received from customers	\$1,465,000
Cash received from issuing common stock	50,000
Cash payments:	
Cash paid for operating expenses	1,230,000
Cash paid for land	150,000
Cash paid as dividends	30,000

The cash balance as of December 1, 2015, was \$203,000.

Prepare a statement of cash flows for Ousel Travel Service for the year ended November 30, 2016.

PE 1-7B Statement of cash flows **EE 1-7** *p. 20*

OBJ. 5

A summary of cash flows for Sentinel Travel Service for the year ended August 31, 2016, follows:

Casif receipts.
Cash received from custome
Cash received from issuing o
Cash payments:

Cach receipter

Casif received from customers	373 4 ,000
Cash received from issuing common stock	36,000
Cash payments:	
Cash paid for operating expenses	745,600
Cash paid for land	50,000
Cash paid as dividends	18,000

The cash balance as of September 1, 2015, was \$89,000.

(Continued)

\$724 000

EE 1-8 p. 23 PE 1-8A Ratio of liabilities to stockholders' equity

OBJ. 6





 Dec. 31, 2016
 Dec. 31, 2015

 Total liabilities
 \$547,800
 \$518,000

 Total stockholders' equity
 415,000
 370,000

a. Compute the ratio of liabilities to stockholders' equity.

The following data were taken from Mesa Company's balance sheet:

b. Has the creditor's risk increased or decreased from December 31, 2015, to December 31, 2016?

EE 1-8 p. 23 PE 1-8B Ratio of liabilities to stockholders' equity

OBJ. 6





 Dec. 31, 2016
 Dec. 31, 2015

 Total liabilities
 \$4,085,000
 \$2,880,000

 Total stockholders' equity
 4,300,000
 3,600,000

The following data were taken from Alvarado Company's balance sheet:

- a. Compute the ratio of liabilities to stockholders' equity.
- b. Has the creditor's risk increased or decreased from December 31, 2015, to December 31, 2016?

Exercises

EX 1-1 Types of businesses

OBJ. 1

Internet Project



The following is a list of well-known companies:

- 1. Alcoa Inc.
- 2. Boeing
- 3. Caterpillar
- 4. Citigroup Inc.
- 5. CVS
- 6. Dow Chemical Company
- 7. eBay Inc.
- 8. FedEx

- 9. Ford Motor Company
- 10. Gap Inc.
- 11. H&R Block
- 12. Hilton Hospitality, Inc.
- 13. Procter & Gamble
- 14. SunTrust
- 15. Walmart Stores, Inc.
- a. Indicate whether each of these companies is primarily a service, merchandise, or manufacturing business. If you are unfamiliar with the company, use the Internet to locate the company's home page or use the finance Web site of Yahoo (finance.yahoo.com).
- b. For which of the preceding companies is the accounting equation relevant?

EX 1-2 Professional ethics

OBJ. 1

A fertilizer manufacturing company wants to relocate to Yellowstone County. A report from a fired researcher at the company indicates the company's product is releasing toxic by-products. The company suppressed that report. A later report commissioned by the company shows there is no problem with the fertilizer.

Should the company's chief executive officer reveal the content of the unfavorable report in discussions with Yellowstone County representatives? Discuss.



EX 1-3 Business entity concept

OBJ. 2

Ozark Sports sells hunting and fishing equipment and provides guided hunting and fishing trips. Ozark Sports is owned and operated by Eric Griffith, a well-known sports enthusiast and hunter. Eric's wife, Linda, owns and operates Lake Boutique, a women's clothing store. Eric and Linda have established a trust fund to finance their children's college education. The trust fund is maintained by Missouri State Bank in the name of the children, Mark and Steffy.

a. For each of the following transactions, identify which of the entities listed should record the transaction in its records:

Entities	
L	Lake Boutique
M	Missouri State Bank
0	Ozark Sports
X	None of the above

- 1. Linda authorized the trust fund to purchase mutual fund shares.
- 2. Linda purchased two dozen spring dresses from a St. Louis designer for a special spring sale.
- 3. Eric paid a breeder's fee for an English springer spaniel to be used as a hunting guide dog.
- 4. Linda deposited a \$2,000 personal check in the trust fund at Missouri State Bank.
- 5. Eric paid a local doctor for his annual physical, which was required by the workmen's compensation insurance policy carried by Ozark Sports.
- 6. Eric received a cash advance from customers for a guided hunting trip.
- 7. Linda paid her dues to the YWCA.
- 8. Linda donated several dresses from inventory for a local charity auction for the benefit of a women's abuse shelter.
- 9. Eric paid for dinner and a movie to celebrate their twelfth wedding anniversary.
- 10. Eric paid for an advertisement in a hunters' magazine.
- b. What is a business transaction?

EX 1-4 Accounting equation

OBJ. 3

The total assets and total liabilities (in millions) of Green Mountain Coffee Roasters, Inc. and Starbucks Corporation follow:

	Green Mountain	Starbucks	
Assets	\$3,616	\$8,219	
Liabilities	1,345	3.110	

Determine the stockholders' equity of each company.

EX 1-5 Accounting equation

OBJ. 3

The total assets and total liabilities (in millions) of Dollar Tree Inc. and Target Corporation follow:

	Dollar Tree	Target Corporation
Assets	\$2,329	\$46,630
Liabilities	984	30,809

Determine the stockholders' equity of each company.

EX 1-6 Accounting equation

OBJ. 3

Determine the missing amount for each of the following:

	Assets	=	Liabilities	+	Stockholders' Equity
a.	X	=	\$376,000	+	\$895,000
b.	\$1,375,000	=	Χ	+	\$855,000
c.	\$863,500	=	\$211,000	+	Χ

✓ Starbucks, \$5,109





✓ Dollar Tree, \$1,345





✓ a. \$1,271,000



√ b. \$606,500



EX 1-7 Accounting equation

OBJ. 3, 4

Go44 is a motivational consulting business. At the end of its accounting period, December 31, 2015, Go44 has assets of \$720,000 and liabilities of \$180,000. Using the accounting equation and considering each case independently, determine the following amounts:

- a. Stockholders' equity as of December 31, 2015.
- b. Stockholders' equity as of December 31, 2016, assuming that assets increased by \$96,500 and liabilities increased by \$30,000 during 2016.
- c. Stockholders' equity as of December 31, 2016, assuming that assets decreased by \$168,000 and liabilities increased by \$15,000 during 2016.
- d. Stockholders' equity as of December 31, 2016, assuming that assets increased by \$175,000 and liabilities decreased by \$18,000 during 2016.
- e. Net income (or net loss) during 2016, assuming that as of December 31, 2016, assets were \$880,000, liabilities were \$220,000, and no additional common stock was issued or dividends paid.

EX 1-8 Asset, liability, and stockholders' equity items

OBJ. 3

Indicate whether each of the following is identified with (1) an asset, (2) a liability, or (3) stockholders' equity:

- a. accounts payable
- b. cash
- c. fees earned
- d. land
- e. supplies
- f. wages expense

EX 1-9 Effect of transactions on accounting equation

OBJ. 4

Describe how the following business transactions affect the three elements of the accounting equation:

- a. Invested cash in business.
- b. Paid for utilities used in the business.
- c. Purchased supplies for cash.
- d. Purchased supplies on account.
- e. Received cash for services performed.

EX 1-10 Effect of transactions on accounting equation

OBJ. 4

- a. A vacant lot acquired for \$115,000 is sold for \$298,000 in cash. What is the effect of the sale on the total amount of the seller's (1) assets, (2) liabilities, and (3) stockholders' equity?
- b. Assume that the seller owes \$80,000 on a loan for the land. After receiving the \$298,000 cash in (a), the seller pays the \$80,000 owed. What is the effect of the payment on the total amount of the seller's (1) assets, (2) liabilities, and (3) stockholders' equity?
- c. Is it true that a transaction always affects at least two elements (Assets, Liabilities, or Stockholders' Equity) of the accounting equation? Explain.

EX 1-11 Effect of transactions on stockholders' equity

OBJ. 4

Indicate whether each of the following types of transactions will either (a) increase stockholders' equity or (b) decrease stockholders' equity:

- 1. expenses
- 2. issuing common stock in exchange for cash
- 3. dividends
- 4. revenues

✓ a. (1) increase \$183,000



EX 1-12 Transactions OBJ. 4

The following selected transactions were completed by Cota Delivery Service during July:

- 1. Received cash in exchange for common stock, \$35,000.
- 2. Purchased supplies for cash, \$1,100.
- 3. Paid rent for October, \$4,500.
- 4. Paid advertising expense, \$900.
- 5. Received cash for providing delivery services, \$33,000.
- 6. Billed customers for delivery services on account, \$58,000.
- 7. Paid creditors on account, \$2,900.
- 8. Received cash from customers on account, \$27,500.
- 9. Determined that the cost of supplies on hand was \$300 and \$8,600 of supplies had been used during the month.
- 10. Paid cash dividends, \$2,500.

Indicate the effect of each transaction on the accounting equation by listing the numbers identifying the transactions, (1) through (10), in a column, and inserting at the right of each number the appropriate letter from the following list:

- a. Increase in an asset, decrease in another asset.
- b. Increase in an asset, increase in a liability.
- c. Increase in an asset, increase in stockholders' equity.
- d. Decrease in an asset, decrease in a liability.
- e. Decrease in an asset, decrease in stockholders' equity.

EX 1-13 Nature of transactions

OBJ. 4

Teri West operates her own catering service. Summary financial data for July are presented in equation form as follows. Each line designated by a number indicates the effect of a transaction on the equation. Each increase and decrease in stockholders' equity, except transaction (5), affects net income.

	Assets			= Liabilities +				Stockholders' Equity			
	Cash	+ Supplies +	- Land	=	Accounts Payable	+	Common Stock	Retained Earnings –	Dividends	Fees + Earned -	- Expenses
Bal.	40,000	3,000	82,000		7,500		50,000	67,500			
1.	+71,800									+71,800	
2.	-15,000		+15,000								
3.	-47,500										-47,500
4.		+1,100			+1,100						
5.	-5,000								-5,000		
6.	-4,000				-4,000						
7.		-1,500									-1,500
Bal.	40,300	2,600	97,000		4,600		50,000	67,500	-5,000	71,800	-49,000

- a. Describe each transaction.
- b. What is the amount of the net increase in cash during the month?
- c. What is the amount of the net increase in stockholders' equity during the month?
- d. What is the amount of the net income for the month?
- e. How much of the net income for the month was retained in the business?

EX 1-14 Net income and dividends

OBJ. 5

The income statement for the month of February indicates a net income of \$17,500. During the same period, \$25,500 in cash dividends were paid.

Would it be correct to say that the business incurred a net loss of \$8,000 during the month? Discuss.

√ d. \$22,800



✓ Mars: Net income, \$225,000



EX 1-15 Net income and stockholders' equity for four businesses

OBJ. 5

Four different corporations, Jupiter, Mars, Saturn, and Venus, show the same balance sheet data at the beginning and end of a year. These data, exclusive of the amount of stockholders' equity, are summarized as follows:

	Total Assets	Total Liabilities
Beginning of the year	\$550,000	\$215,000
End of the year	844,000	320,000

On the basis of the preceding data and the following additional information for the year, determine the net income (or loss) of each company for the year. (*Hint:* First determine the amount of increase or decrease in stockholders' equity during the year.)

Jupiter: No additional common stock was issued and no dividends were paid.

Mars: No additional common stock was issued, but dividends of \$36,000 were paid.

Saturn: Additional common stock of \$60,000 was issued, but no dividends were paid.

Venus: Additional common stock of \$60,000 was issued and dividends of \$36,000 were paid.

EX 1-16 Balance sheet items

OBJ. 5

From the following list of selected items taken from the records of Bobcat Appliance Service as of a specific date, identify those that would appear on the balance sheet:

1	Accounts Receivable	6	Supplies
1.	Accounts Receivable	0.	Supplies
2.	Cash	7.	Supplies Expense
3.	Common Stock	8.	Utilities Expense
4.	Fees Earned	9.	Wages Expense
5.	Land	10.	Wages Pavable

EX 1-17 Income statement items

OBJ. 5

Based on the data presented in Exercise 1-16, identify those items that would appear on the income statement.

EX 1-18 Retained earnings statement

OBJ. 5

Financial information related to Udder Products Company for the month ended April 30, 2016, is as follows:

Net income for April	\$166,000
Cash dividends paid during April	25,000
Retained earnings, April 1, 2016	384,500

- a. Prepare a retained earnings statement for the month ended April 30, 2016.
- b. Why is the retained earnings statement prepared before the April 30, 2016, balance sheet?

EX 1-19 Income statement

OBJ. 5

Dairy Services was organized on August 1, 2016. A summary of the revenue and expense transactions for August follows:

Fees earned	\$783,000
Wages expense	550,000
Rent expense	35,000
Supplies expense	8,500
Miscellaneous expense	11,400

Prepare an income statement for the month ended August 31.

✓ Net income: \$178,100

✓ Retained earnings, April 30, 2016: \$525,500



ME HOW



EX 1-20 Missing amounts from balance sheet and income statement data

OBJ. 5

√ (a) \$135,000

√ b. \$135,000



One item is omitted in each of the following summaries of balance sheet and income statement data for the following four different corporations:

	Freeman	Heyward	Jones	Ramirez
Beginning of the year:				
Assets	\$ 900,000	\$490,000	\$115,000	(d)
Liabilities	360,000	260,000	81,000	\$120,000
End of the year:				
Assets	1,260,000	675,000	100,000	270,000
Liabilities	330,000	220,000	80,000	136,000
During the year:				
Additional common stock issued	(a)	150,000	10,000	55,000
Dividends	75,000	32,000	(c)	39,000
Revenue	570,000	(b)	115,000	115,000
Expenses	240,000	128,000	122,500	128,000

Determine the missing amounts, identifying them by letter. (Hint: First determine the amount of increase or decrease in stockholders' equity during the year.)

EX 1-21 Balance sheets, net income

OBJ. 5

Financial information related to Ebony Interiors for February and March 2016 is as follows:

	February 29, 2016	March 31, 2016
Cash	320,000	380,000
Accounts receivable	800,000	960,000
Supplies	30,000	35,000
Accounts payable	310,000	400,000
Common stock	200,000	200,000
Retained earnings	?	?

- a. Prepare balance sheets for Ebony Interiors as of February 29 and March 31, 2016.
- b. Determine the amount of net income for March, assuming that no additional common stock was issued and no dividends were paid during the month.
- c. Determine the amount of net income for March, assuming that no additional common stock was issued, but dividends of \$50,000 were paid during the month.

EX 1-22 Financial statements

OBJ. 5

Each of the following items is shown in the financial statements of Exxon Mobil Corporation:

1. Accounts payable Cash equivalents 2.

9. Marketable securities

- Crude oil inventory
- 10. Notes and loans payable

4. Equipment

- 11. Notes receivable
- **Exploration** expenses
- 12. Operating expenses
- 13. Prepaid taxes
- Income taxes payable
- Sales

Investments

15. Selling expenses

- Long-term debt
- item would appear.
- b. Can an item appear on more than one financial statement?
- c. Is the accounting equation relevant for Exxon Mobil Corporation?

EX 1-23 Statement of cash flows

Indicate whether each of the following activities would be reported on the statement of cash flows as (a) an operating activity, (b) an investing activity, or (c) a financing activity: (Continued)

a. Identify the financial statement (balance sheet or income statement) in which each



ME HOW

- 1. Cash received from fees earned.
- 2. Cash paid for expenses.
- 3. Cash paid for land.
- 4. Cash paid for dividends.

EX 1-24 Statement of cash flows

OBJ. 5

A summary of cash flows for Ethos Consulting Group for the year ended May 31, 2016, follows:



The cash balance as of June 1, 2015, was \$58,000.

Prepare a statement of cash flows for Ethos Consulting Group for the year ended May 31, 2016.

EX 1-25 Financial statements

OBJ. 5

15,000 \$ 5,000

25,000

\$ 30,000

We-Sell Realty, organized August 1, 2016, is owned and operated by Omar Farah. How many errors can you find in the following statements for We-Sell Realty, prepared after its first month of operations?

We-Sell Realty Income Statement

August 31, 2016			
Sales commissions		\$140	0,000
Expenses:			
Office salaries expense	\$87,000		
Rent expense	18,000		
Automobile expense	7,500		
Miscellaneous expense	2,200		
Supplies expense	1,150		
Total expenses		115	5,850
Net income		\$ 25	,000
Omar Farah Retained Earnings Statement August 31, 2015			
Retained earnings, August 1, 2016		\$	0
Less dividends during August		10	,000
<u> </u>		\$(10,	,000)

Balance Sheet For the Month Ended August 31, 2016

Issued additional common stock August 1, 2016.....

Net income for August.....

Retained earnings, August 31, 2016.....

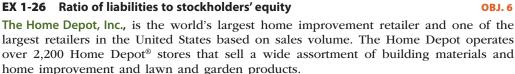
Assets		Liabilities		
Cash	\$ 8,900	Accounts receivable	\$38,600	
Accounts payable	22,350	Supplies	4,000	
		Stockholders' Equity		
		Retained earnings	30,000	
Total assets	\$31,250	Total liabilities and stockholders' equity	\$72,600	



✓ Correct amount of total assets is \$51,500.

ME HOW





The Home Depot recently reported the following balance sheet data (in millions):

	Year 2	Year 1
Total assets	\$40,518	\$40,125
Total stockholders' equity	22,620	21,236

- a. Determine the total liabilities at the end of Years 2 and 1.
- b. Determine the ratio of liabilities to stockholders' equity for Year 2 and Year 1. Round to two decimal places.
- What conclusions regarding the margin of protection to the creditors can you draw from (b)?

EX 1-27 Ratio of liabilities to stockholders' equity

OBJ. 6

Lowe's Companies Inc., a major competitor of The Home Depot in the home improvement business, operates over 1,700 stores. Lowe's recently reported the following balance sheet data (in millions):

	Year 2	Year 1
Total assets	\$33,559	\$33,699
Total liabilities	17,026	15,587

- a. Determine the total stockholders' equity at the end of Years 2 and 1.
- b. Determine the ratio of liabilities to stockholders' equity for Year 2 and Year 1. Round to two decimal places.
- What conclusions regarding the risk to the creditors can you draw from (b)?
- d. Using the balance sheet data for The Home Depot in Exercise 1-26, how does the ratio of liabilities to stockholders' equity of Lowe's compare to that of The Home Depot?

Problems: Series A

PR 1-1A Transactions

OBJ. 4

On April 1 of the current year, Andrea Byrd established a business to manage rental property. She completed the following transactions during April:

- a. Opened a business bank account with a deposit of \$45,000 in exchange for common stock.
- b. Purchased office supplies on account, \$2,000.
- c. Received cash from fees earned for managing rental property, \$8,500.
- d. Paid rent on office and equipment for the month, \$5,000.
- e. Paid creditors on account, \$1,375.
- f. Billed customers for fees earned for managing rental property, \$11,250.
- g. Paid automobile expenses (including rental charges) for month, \$840, and miscellaneous expenses, \$900.
- h. Paid office salaries, \$3,600.
- Determined that the cost of supplies on hand was \$550; therefore, the cost of supplies used was \$1,450.
- j. Paid dividends, \$2,000.

Instructions

1. Indicate the effect of each transaction and the balances after each transaction, using the following tabular headings: (Continued)



✓ Cash bal. at end of

April: \$39,785





Assets	= Liabilities +		Stockholders' Equity								
Accounts	Accounts	Common				Fees	Rent	Salaries	Supplies	Auto	Misc.
Cash + Receivable + Supplie	es = Payable +	Stock	_	Dividends	+	Earned ·	 Expense 	Expense	Expense	Expense	 Expense

- Briefly explain why issuing common stock and revenues increased stockholders' equity, while dividends and expenses decreased stockholders' equity.
- 3. Determine the net income for April.
- 4. How much did April's transactions increase or decrease retained earnings?

PR 1-2A Financial statements

OBJ. 5

The amounts of the assets and liabilities of Nordic Travel Agency at December 31, 2016, the end of the year, and its revenue and expenses for the year follow. The retained earnings were \$600,000 on January 1, 2016, the beginning of the year. During the year, dividends of \$42,000 were paid.

Accounts payable	\$ 69,500	Miscellaneous expense	\$ 6,400
Accounts receivable	285,000	Rent expense	36,000
Cash	190,500	Supplies	5,500
Common stock	70,000	Supplies expense	4,100
Fees earned	912,500	Utilities expense	28,500
Land	544,000	Wages expense	510,000

Instructions

- 1. Prepare an income statement for the year ended December 31, 2016.
- 2. Prepare a retained earnings statement for the year ended December 31, 2016.
- 3. Prepare a balance sheet as of December 31, 2016.
- 4. What item appears on both the retained earnings statement and the balance sheet?

PR 1-3A Financial statements

OBJ. 5

✓ 1. Net income: \$31,200

✓ 1. Net income:

\$327,500



Seth Feye established Reliance Financial Services on July 1, 2016. Reliance Financial Services offers financial planning advice to its clients. The effect of each transaction and the balances after each transaction for July follow:

		Assets	=	= Liabilities ⊣	F			Stockholo	Stockholders' Equity				
	Cash	Accounts + Receivable	+ Supplies =	Accounts = Payable +	Common - Stock	– Dividends +	Fees Earned	Salaries – Expense	Rent – Expense –	Auto Expense –	Supplies Expense	Misc. – Expense	
a.	+50,000				+50,000								
b.			+7,000	+7,000									
Bal.	50,000		7,000	7,000	50,000								
c.	-3,600			-3,600									
Bal.	46,400		7,000	3,400	50,000								
d.	+110,000						+110,000						
Bal.	156,400		7,000	3,400	50,000		110,000						
e.	-33,000								-33,000				
Bal.	123,400		7,000	3,400	50,000		110,000		-33,000				
f.	-20,800									-16,000		-4,800	
Bal.	102,600		7,000	3,400	50,000		110,000		-33,000	-16,000		-4,800	
g.	-55,000							-55,000					
Bal.	47,600		7,000	3,400	50,000		110,000	-55,000	-33,000	-16,000		-4,800	
h.			-4,500								-4,500		
Bal.	47,600		2,500	3,400	50,000		110,000	-55,000	-33,000	-16,000	-4,500	-4,800	
i.		+34,500					+ 34,500						
Bal.	47,600	34,500	2,500	3,400	50,000		144,500	-55,000	-33,000	-16,000	-4,500	-4,800	
j.	-15,000					-15,000							
Bal.	32,600	34,500	2,500	3,400	50,000	-15,000	144,500	-55,000	-33,000	-16,000	-4,500	-4,800	

Instructions

- 1. Prepare an income statement for the month ended July 31, 2016.
- 2. Prepare a retained earnings statement for the month ended July 31, 2016.
- 3. Prepare a balance sheet as of July 31, 2016.
- 4. (Optional) Prepare a statement of cash flows for the month ending July 31, 2016.

PR 1-4A Transactions; financial statements

OBJ. 4. 5

✓ 2. Net income: \$27,350 On July 1, 2016, Pat Glenn established Half Moon Realty. Pat completed the following transactions during the month of July:

- a. Opened a business bank account with a deposit of \$25,000 in exchange for common stock.
- b. Purchased office supplies on account, \$1,850.
- c. Paid creditor on account, \$1,200.
- d. Earned sales commissions, receiving cash, \$41,500.
- e. Paid rent on office and equipment for the month, \$3,600.
- f. Paid dividends, \$4,000.
- g. Paid automobile expenses (including rental charge) for month, \$3,050, and miscellaneous expenses, \$1,600.
- h. Paid office salaries, \$5,000.
- Determined that the cost of supplies on hand was \$950; therefore, the cost of supplies used was \$900.

Instructions

1. Indicate the effect of each transaction and the balances after each transaction, using the following tabular headings:

Assets =	Liabilities	+	Stockholders' Equity						
	Accounts	Common		Sales	Salaries	Rent	Auto	Supplies	Misc.
Cash + Supplies =	Payable	+ Stock	- Dividends $+$	Commissions -	Expense	- Expense -	Expense –	Expense -	Expense

2. Prepare an income statement for July, a retained earnings statement for July, and a balance sheet as of July 31.

PR 1-5A Transactions; financial statements

OBJ. 4, 5

D'Lite Dry Cleaners is owned and operated by Joel Palk. A building and equipment are currently being rented, pending expansion to new facilities. The actual work of dry cleaning is done by another company at wholesale rates. The assets, liabilities, and common stock of the business on July 1, 2016, are as follows: Cash, \$45,000; Accounts Receivable, \$93,000; Supplies, \$7,000; Land, \$75,000; Accounts Payable, \$40,000; Common Stock, \$60,000. Business transactions during July are summarized as follows:

- Joel Palk invested additional cash in exchange for common stock with a deposit of \$35,000 in the business bank account.
- b. Paid \$50,000 for the purchase of land adjacent to land currently owned by D'Lite Dry Cleaners as a future building site.
- c. Received cash from cash customers for dry cleaning revenue, \$32,125.
- d. Paid rent for the month, \$6,000.
- e. Purchased supplies on account, \$2,500.
- f. Paid creditors on account, \$22,800.
- g. Charged customers for dry cleaning revenue on account, \$84,750.
- h. Received monthly invoice for dry cleaning expense for July (to be paid on August 10), \$29,500.

(Continued)

✓ 3. Net income: \$63.775



- i. Paid the following: wages expense, \$7,500; truck expense, \$2,500; utilities expense, \$1,300; miscellaneous expense, \$2,700.
- j. Received cash from customers on account, \$88,000.
- k. Determined that the cost of supplies on hand was \$5,900; therefore, the cost of supplies used during the month was \$3,600.
- 1. Paid dividends, \$12,000.

Instructions

- 1. Determine the amount of retained earnings as of July 1 of the current year.
- 2. State the assets, liabilities, and stockholders' equity as of July 1 in equation form similar to that shown in this chapter. In tabular form below the equation, indicate increases and decreases resulting from each transaction and the new balances after each transaction.
- 3. Prepare an income statement for July, a retained earnings statement for July, and a balance sheet as of July 31.
- 4. (Optional) Prepare a statement of cash flows for July.

PR 1-6A Missing amounts from financial statements

OBJ. 5

The financial statements at the end of Wolverine Realty's first month of operations are as follows:

Wolverine Realty Income Statement

		ome Statement oth Ended April 30, 2016			
Fees earned				\$	(a)
Expenses:					
Wages expense		\$:\$	300,000		
Rent expense			100,000		
Supplies expense			(b)		
Utilities expense			20,000		
Miscellaneous expense			25,000		
Total expenses				475	,000
Net income				\$275	,000
Retained earnings, April 1, 20 Net income for April		\$	(d) 125,000	\$	(c (e
Retained earnings, April 30, 2	.010			=	(1
	Ba	lverine Realty Nance Sheet Oril 30, 2016			
Assets		Liabilities			
sh	\$462,500	Accounts payable		\$10	0,000
oplies	12,500	Stockholders' E	quity		
nd	150,000	Common stock	\$375,00	0	
		Retained earnings	(h	<u>ı)</u>	
		Total stockholders' equity			(i
		Total liabilities and			
al assets	\$ (g)	stockholders' equity		\$	(j

✓ k. \$750,000

Wolverine Realty Statement of Cash Flows For the Month Ended April 30, 2016

\$	(k)		
(38)	7,500)		
		\$	(I)
			(m)
\$	(n)		
	(o)		
			(p)
		\$	(q)
	\$ (38) \$	(387,500) \$ (n)	(387,500) \$ \$ (n)

Instructions

By analyzing the interrelationships among the four financial statements, determine the proper amounts for (a) through (q).

Problems: Series B

PR 1-1B Transactions

OBJ, 4

✓ Cash bal. at end of March: \$48,650



Amy Austin established an insurance agency on March 1 of the current year and completed the following transactions during March:

- a. Opened a business bank account with a deposit of \$50,000 in exchange for common stock.
- b. Purchased supplies on account, \$4,000.
- c. Paid creditors on account, \$2,300.
- d. Received cash from fees earned on insurance commissions, \$13,800.
- e. Paid rent on office and equipment for the month, \$5,000.
- f. Paid automobile expenses for month, \$1,150, and miscellaneous expenses, \$300.
- g. Paid office salaries, \$2,500.
- h. Determined that the cost of supplies on hand was \$2,700; therefore, the cost of supplies used was \$1,300.
- i. Billed insurance companies for sales commissions earned, \$12,500.
- j. Paid dividends, \$3,900.

Instructions

1. Indicate the effect of each transaction and the balances after each transaction, using the following tabular headings:

Assets	= Liabilities +		Stockholders' Equity							
Accounts	Accounts	Common			Fees	Rent	Salaries	Supplies	Auto	Misc.
Cash + Receivable + Sup	plies = Payable +	Stock	_	Dividends	+ Earned	Expense	Expense	 Expense 	Expense	 Expense

- 2. Briefly explain why issuing common stock and revenues increased stockholders' equity, while dividends and expenses decreased stockholders' equity.
- 3. Determine the net income for March.
- 4. How much did March's transactions increase or decrease retained earnings?

PR 1-2B Financial statements

OBJ. 5

✓ 1. Net income: \$200,000





The amounts of the assets and liabilities of Wilderness Travel Service at April 30, 2016, the end of the year, and its revenue and expenses for the year follow. The retained earnings was \$145,000 at May 1, 2015, the beginning of the year, and dividends of \$40,000 were paid during the year.

Accounts payable	\$ 25,000	Rent expense	\$ 75,000
Accounts receivable	210,000	Supplies	9,000
Cash	146,000	Supplies expense	12,000
Common stock	35,000	Taxes expense	10,000
Fees earned	875,000	Utilities expense	38,000
Miscellaneous expense	15,000	Wages expense	525,000

Instructions

- 1. Prepare an income statement for the year ended April 30, 2016.
- 2. Prepare a retained earnings statement for the year ended April 30, 2016.
- 3. Prepare a balance sheet as of April 30, 2016.
- 4. What item appears on both the income statement and retained earnings statement?

✓ 1. Net income: \$10,900



PR 1-3B Financial statements

OBJ. 5

Jose Loder established Bronco Consulting on August 1, 2016. The effect of each transaction and the balances after each transaction for August follow:

		Assets		=Liabilities+			Sto	ockholders	Equity			
	Cash	Accounts + Receivable	+ Supplies	Accounts = Payable +	Common Stock	– Dividends +	Fees Earned	Salaries – Expense	Rent – Expense	Auto – Expense –	Supplies - Expense -	Misc. - Expense
a.	+75,000				+75,000							
b.			+9,000	+9,000								
Bal.	75,000		9,000	9,000	75,000							
c.	+92,000						+92,000					
Bal.	167,000		9,000	9,000	75,000		92,000					
d.	-27,000								-27,000			
Bal.	140,000		9,000	9,000	75,000		92,000		-27,000			
e.	-6,000			-6,000								
Bal.	134,000		9,000	3,000	75,000		92,000		-27,000			
f.		+33,000					+33,000					
Bal.	134,000	33,000	9,000	3,000	75,000		125,000		-27,000			
g.	-23,000									-15,500		-7,500
Bal.	111,000	33,000	9,000	3,000	75,000		125,000		-27,000	-15,500		-7,500
h.	-58,000							-58,000				
Bal.	53,000	33,000	9,000	3,000	75,000		125,000	-58,000	-27,000	-15,500		-7,500
i.			-6,100								-6,100	
Bal.	53,000	33,000	2,900	3,000	75,000		125,000	-58,000	-27,000	-15,500	-6,100	-7,500
j.	-5,000					-5,000						
Bal.	48,000	33,000	2,900	3,000	75,000	-5,000	125,000	-58,000	-27,000	<u>-15,500</u>	-6,100	-7,500

Instructions

- 1. Prepare an income statement for the month ended August 31, 2016.
- 2. Prepare a retained earnings statement for the month ended August 31, 2016.
- 3. Prepare a balance sheet as of August 31, 2016.
- 4. (Optional) Prepare a statement of cash flows for the month ending August 31, 2016.

PR 1-4B Transactions; financial statements

OBJ. 4, 5

✓ 2. Net income: \$10,850 On April 1, 2016, Maria Adams established Custom Realty. Maria completed the following transactions during the month of April:

- a. Opened a business bank account with a deposit of \$24,000 in exchange for common stock.
- b. Paid rent on office and equipment for the month, \$3,600.
- c. Paid automobile expenses (including rental charge) for month, \$1,350, and miscellaneous expenses, \$600.
- d. Purchased office supplies on account, \$1,200.
- e. Earned sales commissions, receiving cash, \$19,800.
- f. Paid creditor on account, \$750.
- g. Paid office salaries, \$2,500.
- h. Paid dividends, \$3,500.
- i. Determined that the cost of supplies on hand was \$300; therefore, the cost of supplies used was \$900.

Instructions

1. Indicate the effect of each transaction and the balances after each transaction, using the following tabular headings:

Stockholders' Equity						
Damb Cal	lawina Austra	Complian Mina				
		Supplies Misc.				
	Rent Sa					

2. Prepare an income statement for April, a retained earnings statement for April, and a balance sheet as of April 30.

PR 1-5B Transactions; financial statements

OBJ. 4, 5

Bev's Dry Cleaners is owned and operated by Beverly Zahn. A building and equipment are currently being rented, pending expansion to new facilities. The actual work of dry cleaning is done by another company at wholesale rates. The assets, liabilities, and common stock of the business on November 1, 2016, are as follows: Cash, \$39,000; Accounts Receivable, \$80,000; Supplies, \$11,000; Land, \$50,000; Accounts Payable, \$31,500; Common Stock, \$50,000. Business transactions during November are summarized as follows:

- a. Beverly Zahn invested additional cash in exchange for common stock with a deposit of \$21,000 in the business bank account.
- b. Purchased land adjacent to land currently owned by Bev's Dry Cleaners to use in the future as a parking lot, paying cash of \$35,000.
- c. Paid rent for the month, \$4,000.
- d. Charged customers for dry cleaning revenue on account, \$72,000.
- e. Paid creditors on account, \$20,000.
- f. Purchased supplies on account, \$8,000.
- g. Received cash from cash customers for dry cleaning revenue, \$38,000.
- h. Received cash from customers on account, \$77,000.
- i. Received monthly invoice for dry cleaning expense for November (to be paid on December 10), \$29,450.
- j. Paid the following: wages expense, \$24,000; truck expense, \$2,100; utilities expense, \$1,800; miscellaneous expense, \$1,300.
- k. Determined that the cost of supplies on hand was \$11,800; therefore, the cost of supplies used during the month was \$7,200.
- 1. Paid dividends, \$5,000.

Instructions

- 1. Determine the amount of retained earnings as of November 1.
- State the assets, liabilities, and stockholders' equity as of November 1 in equation form similar to that shown in this chapter. In tabular form below the equation, indicate increases and decreases resulting from each transaction and the new balances after each transaction.

(Continued)

✓ 3. Net income: \$40,150



Expenses:

- 3. Prepare an income statement for November, a retained earnings statement for November, and a balance sheet as of November 30.
- 4. (Optional) Prepare a statement of cash flows for November.

PR 1-6B Missing amounts from financial statements

OBJ. 5

\$400,000

✓ i. \$208,000

The financial statements at the end of Atlas Realty's first month of operations follow:

Atlas Realty
Income Statement
For the Month Ended May 31, 2016

Wages expense			\$ (a)	
Rent expense			48,000	
Supplies expense			17,600	
Utilities expense			14,400	
Miscellaneous expense			4,800	
Total expenses				288,000
Net income				\$ (b)
		Atlas Realty ined Earnings Statement Month Ended May 31, 2016		
Retained earnings, May 1, 20				\$ (c)
3 . , .			\$ (d)	Ψ (5)
Less dividends			(e)	
Increase in retained earnings				(f)
				\$ (g)
		Atlas Realty Balance Sheet May 31, 2016		
Assets		Liabi	ilities	
Cash	\$123,200	Accounts payable		\$48,000
Supplies	12,800	Stockhold	ers' Equity	
Supplies		Stockhold Common stock	. ,	J)
• •	12,800		\$ ()	*
• •	12,800	Common stock	\$ (J	*
• •	12,800	Common stock	\$ (J	<u>()</u>
• •	12,800	Common stock	\$ (J	<u>()</u>
Land	12,800 (h)	Common stock	\$ (J	<u>(I)</u>
Land	12,800 (h) \$ (i)	Common stock	\$ (J	<u>(I)</u>
Land	12,800 (h) \$ (i) Stat	Common stock	\$ (J	<u>(I)</u>
Total assets	12,800 (h) \$ (i) Stat For the M ities:	Common stock	\$ (J	<u>(I)</u>
Total assets	12,800 (h) \$ (i) Stat For the M ities:	Common stock	\$ (J	<u>(I)</u>
Total assets	12,800 (h) \$ (i) Stat For the M ities: rs	Common stock	\$ (J (k 	<u>(I)</u>
Cash flows from operating activity Cash received from customer Deduct cash payments for ex Net cash flows from operating Cash flows from investing activity	\$\(\frac{\(\beta\)}{\(\beta\)}\) \$\frac{\(\beta\)}{\(\beta\)}\] \$\frac{\(\beta\)}{\(\beta\)}	Common stock	\$ (J (k 	(I) <u>\$ (m)</u> \$ (o)
Cash flows from operating activity Cash received from customer Deduct cash payments for ex Net cash flows from operatin Cash flows from investing activity Cash payments for acquisitio	\$\frac{\(\beta\)}{\(\beta\)}\$ \$\frac{\(\beta\)}{\(\beta\)} \(\beta\) \$\f	Common stock	\$ (J (k 	(I) \$ (m)
Cash flows from operating activity Cash received from customer Deduct cash payments for ex Net cash flows from investing activity Cash payments for acquisition Cash flows from financing activity Cash flows from flows	12,800 (h) \$\frac{\\$ (i)}{\} \$\frac{\} (i)}{\} \$\frac{\} (i)}{\} \$\frac{\} (i)}{\} \$\frac{\} (i)}{\} \$	Common stock	\$ (.) \$ (n) _(252,800)	(I) <u>\$ (m)</u> \$ (o)
Cash flows from operating activity Cash received from customer Deduct cash payments for ex Net cash flows from operatiny Cash flows from investing activity Cash payments for acquisition Cash flows from financing activity Cash received from issuing co	\$\frac{\(\beta\)}{\(\beta\)}\$ \$\frac{\(\beta\)}{\(\beta\)} \(\beta\) \$\f	Common stock	\$ (D) (252,800)	(I) <u>\$ (m)</u> \$ (o)
Cash flows from operating activity Cash received from customer Deduct cash payments for ex Net cash flows from operatiny Cash flows from investing activity Cash payments for acquisition Cash flows from financing activity Cash received from issuing conduct cash dividends	\$\frac{\(\beta\)}{\(\beta\)}\$ \$\frac{\(\beta\)}{\(\beta\)}{\(\beta\)} \(\beta\) \$\frac{\(\beta\)}{\(\beta\)} \(\	Common stock	\$ (.) \$ (n) _(252,800)	\$ (o) (120,000)
Cash flows from operating activity Cash received from customer Deduct cash payments for ex Net cash flows from operatiny Cash flows from investing activity Cash payments for acquisition Cash flows from financing activity Cash received from issuing co	\$\frac{\(\beta\)}{\(\beta\)}\$ \$\frac{\(\beta\)}{\(\beta\)}{\(\beta\)} \(\beta\) \$\frac{\(\beta\)}{\(\beta\)} \(\	Common stock	\$ (D) (252,800)	(I) <u>\$ (m)</u> \$ (o)

Instructions

By analyzing the interrelationships among the four financial statements, determine the proper amounts for (a) through (q).

Continuing Problem

✓ 2. Net income: \$1,340 Peyton Smith enjoys listening to all types of music and owns countless CDs. Over the years, Peyton has gained a local reputation for knowledge of music from classical to rap and the ability to put together sets of recordings that appeal to all ages.

During the last several months, Peyton served as a guest disc jockey on a local radio station. In addition, Peyton has entertained at several friends' parties as the host deejay.

On June 1, 2016, Peyton established a corporation known as PS Music. Using an extensive collection of music MP3 files, Peyton will serve as a disc jockey on a fee basis for weddings, college parties, and other events. During June, Peyton entered into the following transactions:

- June 1. Deposited \$4,000 in a checking account in the name of PS Music in exchange for common stock.
 - Received \$3,500 from a local radio station for serving as the guest disc jockey for June.
 - 2. Agreed to share office space with a local real estate agency, Pinnacle Realty. PS Music will pay one-fourth of the rent. In addition, PS Music agreed to pay a portion of the wages of the receptionist and to pay one-fourth of the utilities. Paid \$800 for the rent of the office.
 - 4. Purchased supplies from City Office Supply Co. for \$350. Agreed to pay \$100 within 10 days and the remainder by July 5, 2016.
 - 6. Paid \$500 to a local radio station to advertise the services of PS Music twice daily for two weeks.
 - 8. Paid \$675 to a local electronics store for renting digital recording equipment.
 - 12. Paid \$350 (music expense) to Cool Music for the use of its current music demos to make various music sets.
 - 13. Paid City Office Supply Co. \$100 on account.
 - 16. Received \$300 from a dentist for providing two music sets for the dentist to play for her patients.
 - 22. Served as disc jockey for a wedding party. The father of the bride agreed to pay \$1,000 in July.
 - 25. Received \$500 for serving as the disc jockey for a cancer charity ball hosted by the local hospital.
 - Paid \$240 (music expense) to Galaxy Music for the use of its library of music demos.
 - 30. Received \$900 for serving as PS disc jockey for a local club's monthly dance.
 - 30. Paid Pinnacle Realty \$400 for PS Music's share of the receptionist's wages for June.
 - 30. Paid Pinnacle Realty \$300 for PS Music's share of the utilities for June.
 - 30. Determined that the cost of supplies on hand is \$170. Therefore, the cost of supplies used during the month was \$180.
 - 30. Paid for miscellaneous expenses, \$415.
 - 30. Paid \$1,000 royalties (music expense) to National Music Clearing for use of various artists' music during the month.
 - 30. Paid dividends, \$500.

Instructions

1. Indicate the effect of each transaction and the balances after each transaction, using the following tabular headings:

Assets	= Liabili	ties +	Stockholders' Equity								
					Office	Equipment					
Accts.	Accounts	Common	Fees	Music	Rent	Rent	Advertising	Wages	Utilities	Supplies	Misc.
Cash + Rec. + Supplies	= Payable +	Stock	- Dividends + Earned -	Exp.	– Exp.	Exp.	– Exp	- Exp	- Exp. ·	Exp	- Exp.

- 2. Prepare an income statement for PS Music for the month ended June 30, 2016.
- 3. Prepare a retained earnings statement for PS Music for the month ended June 30, 2016.
- 4. Prepare a balance sheet for PS Music as of June 30, 2016.

Cases & Projects



CP 1-1 Ethics and professional conduct in business

Group Project

Colleen Fernandez, president of Rhino Enterprises, applied for a \$175,000 loan from First Federal Bank. The bank requested financial statements from Rhino Enterprises as a basis for granting the loan. Colleen has told her accountant to provide the bank with a balance sheet. Colleen has decided to omit the other financial statements because there was a net loss during the past year.

In groups of three or four, discuss the following questions:

- 1. Is Colleen behaving in a professional manner by omitting some of the financial statements?
- 2. a. What types of information about their businesses would owners be willing to provide bankers? What types of information would owners not be willing to provide?
 - b. What types of information about a business would bankers want before extending a loan?
 - c. What common interests are shared by bankers and business owners?

CP 1-2 Net income

On January 1, 2015, Dr. Marcie Cousins established Health-Wise Medical, a medical practice organized as a corporation. The following conversation occurred the following August between Dr. Cousins and a former medical school classmate, Dr. Avi Abu, at an American Medical Association convention in Seattle:

Dr. Abu: Marcie, good to see you again. Why didn't you call when you were in Miami? We could have had dinner together.

Dr. Cousins: Actually, I never made it to Miami this year. My husband and kids went up to our Vail condo twice, but I got stuck in Jacksonville. I opened a new consulting practice this January and haven't had any time for myself since.

Dr. Abu: I heard about it ... Health ... something ... right?

Dr. Cousins: Yes, Health-Wise Medical. My husband chose the name.

Dr. Abu: I've thought about doing something like that. Are you making any money? I mean, is it worth your time?

Dr. Cousins: You wouldn't believe it. I started by opening a bank account with \$25,000, and my July bank statement has a balance of \$80,000. Not bad for six months—all pure profit.

Dr. Abu: Maybe I'll try it in Miami! Let's have breakfast together tomorrow and you can fill me in on the details.

Comment on Dr. Cousins' statement that the difference between the opening bank balance (\$25,000) and the July statement balance (\$80,000) is pure profit.

CP 1-3 Transactions and financial statements

Lisa Duncan, a junior in college, has been seeking ways to earn extra spending money. As an active sports enthusiast, Lisa plays tennis regularly at the Phoenix Tennis Club, where her family has a membership. The president of the club recently approached Lisa with the proposal that she manage the club's tennis courts. Lisa's primary duty would be to supervise the operation of the club's four indoor and 10 outdoor courts, including court reservations.

In return for her services, the club would pay Lisa \$325 per week, plus Lisa could keep whatever she earned from lessons. The club and Lisa agreed to a one-month trial, after which both would consider an arrangement for the remaining two years of Lisa's college career. On this basis, Lisa organized Serve-N-Volley. During September 2016, Lisa managed the tennis courts and entered into the following transactions:

- a. Opened a business account by depositing \$950.
- b. Paid \$300 for tennis supplies (practice tennis balls, etc.).
- c. Paid \$275 for the rental of video equipment to be used in offering lessons during September.

- d. Arranged for the rental of two ball machines during September for \$250. Paid \$100 in advance, with the remaining \$150 due October 1.
- e. Received \$1,750 for lessons given during September.
- f. Received \$600 in fees from the use of the ball machines during September.
- g. Paid \$800 for salaries of part-time employees who answered the telephone and took reservations while Lisa was giving lessons.
- h. Paid \$290 for miscellaneous expenses.
- i. Received \$1,300 from the club for managing the tennis courts during September.
- j. Determined that the cost of supplies on hand at the end of the month totaled \$180; therefore, the cost of supplies used was \$120.
- k. Withdrew \$400 for personal use on September 30.

As a friend and accounting student, you have been asked by Lisa to aid her in assessing the venture.

1. Indicate the effect of each transaction and the balances after each transaction, using the following tabular headings:

Assets	= Liabilities +			Owner's Equity						
		Lisa	Lisa							
	Accounts	Duncan,	Duncan,	Fees	Salaries	Rent	Supplies	Misc.		
Cash + Supplies	= Payable +	Capital	 Drawing 	+ Earned	– Expense –	Expense -	- Expense	 Expense 		

- 2. Prepare an income statement for September.
- 3. Prepare a statement of owner's equity for September. The statement of owner's equity for a proprietorship is similar to the retained earnings statement for a corporation. The balance of the owner's capital as of the beginning of the period is listed first. Any investments made by the owner during the period are then listed and the net income (net loss) is added (subtracted) to determine a subtotal. From this subtotal, the owner's withdrawals are subtracted to determine the increase (decrease) in owner's equity for the period. This increase (decrease) is then added to (subtracted from) the beginning owner's equity to determine the owner's equity as of the end of the period.
- 4. Prepare a balance sheet as of September 30.
- 5. a. Assume that Lisa Duncan could earn \$10 per hour working 30 hours a week as a waitress. Evaluate which of the two alternatives, working as a waitress or operating Serve-N-Volley, would provide Lisa with the most income per month.
 - b. Discuss any other factors that you believe Lisa should consider before discussing a long-term arrangement with the Phoenix Tennis Club.

CP 1-4 Certification requirements for accountants

By satisfying certain specific requirements, accountants may become certified as public accountants (CPAs), management accountants (CMAs), or internal auditors (CIAs). Find the certification requirements for one of these accounting groups by accessing one of the following Web sites:

Site	Description
www.ais-cpa.com	This site lists the address and/or Internet link for each state's board of
	accountancy. Find your state's requirements.
www.imanet.org	This site lists the requirements for becoming a CMA.
www.theiia.org	This site lists the requirements for becoming a CIA.

CP 1-5 Cash flows

Amazon.com, an Internet retailer, was incorporated and began operation in the mid-90s. On the statement of cash flows, would you expect Amazon.com's net cash flows from operating, investing, and financing activities to be positive or negative for its first three years of operations? Use the following format for your answers, and briefly explain your logic.

(Continued)





	First Year	Second Year	Third Year	
Net cash flows from operating activities	negative			
Net cash flows from investing activities				
Net cash flows from financing activities				

Internet Project



CP 1-6 Financial analysis

The now defunct Enron Corporation, once headquartered in Houston, Texas, provided products and services for natural gas, electricity, and communications to wholesale and retail customers. Enron's operations were conducted through a variety of subsidiaries and affiliates that involved transporting gas through pipelines, transmitting electricity, and managing energy commodities. The following data were taken from Enron's financial statements:

	In millions
Total revenues	\$100,789
Total costs and expenses	98,836
Operating income	1,953
Net income	979
Total assets	65,503
Total liabilities	54,033
Total stockholders' equity	11,470
Net cash flows from operating activities	4,779
Net cash flows from investing activities	(4,264)
Net cash flows from financing activities	571
Net increase in cash	1,086

The market price of Enron's stock was approximately \$83 per share when the prior financial statement data were taken. Before it went bankrupt, Enron's stock sold for \$0.22 per share.

Review the preceding financial statement data and search the Internet for articles on Enron Corporation. Briefly explain why Enron's stock dropped so dramatically.



Analyzing Transactions

Apple Inc. TM

very day it seems like we get an incredible amount of incoming e-mail messages—from friends, relatives, subscribed e-mail lists, and even spammers! But how do you organize all of these messages? You might create folders to sort messages by sender, topic, or project. Perhaps you use keyword search utilities. You might even use filters or rules to automatically delete spam or send messages from your best friend to a special folder. In any case, you are organizing information so that it is simple to retrieve and allows you to understand, respond, or refer to the messages.

In the same way that you organize your e-mail, companies develop an organized method for processing, recording, and summarizing financial transactions. For example, **Apple Inc.** has a huge volume of financial transactions, resulting from sales of its innovative computers, digital media (iTunes),

iPods, iPhones, and iPads. When Apple sells an iPad, a customer has the option of paying with credit card, a debit or check card, an Apple gift card, a financing arrangement, or cash. In order to analyze only the information related to Apple's cash transactions, the company must record or summarize all these similar sales using a single category or "cash" account. Similarly, Apple will record credit card payments for iPads and sales from financing arrangements in different accounts (records).

While Chapter 1 used the accounting equation (Assets = Liabilities + Stockholders' Equity) to analyze and record financial transactions, this chapter presents more practical and efficient recording methods that most companies use. In addition, this chapter discusses possible accounting errors that may occur, along with methods to detect and correct them.

Learning Objectives	
After studying this chapter, you should be able to: Describe the characteristics of an account and a chart of accounts. Using Accounts to Record Transactions Chart of Accounts	Example Exercises
Describe and illustrate journalizing transactions using the double-entry accounting system. Double-Entry Accounting System Balance Sheet Accounts Income Statement Accounts Dividends Normal Balances Journalizing	EE 2-1 EE 2-2
Describe and illustrate the journalizing and posting of transactions to accounts. Posting Journal Entries to Accounts	EE 2-3 EE 2-4 EE 2-5
Prepare an unadjusted trial balance and explain how it can be used to discover errors. Trial Balance Errors Affecting the Trial Balance Errors Not Affecting the Trial Balance	EE 2-6 EE 2-7
Describe and illustrate the use of horizontal analysis in evaluating a company's performance and financial condition. Financial Analysis and Interpretation: Horizontal Analysis	EE 2-8
At a Glan	1Ce 2 Page 75



Using Accounts to Record Transactions

In Chapter 1, the November transactions for **NetSolutions** were recorded using the accounting equation format shown in Exhibit 1. However, this format is not efficient or practical for companies that have to record thousands or millions of transactions daily. As a result, accounting systems are designed to show the increases and decreases in each accounting equation element as a separate record. This record is called an **account**.

To illustrate, the Cash column of Exhibit 1 records the increases and decreases in cash. Likewise, the other columns in Exhibit 1 record the increases and decreases in the other accounting equation elements. Each of these columns can be organized into a separate account.

An account, in its simplest form, has three parts.

- · A title, which is the name of the accounting equation element recorded in the account
- · A space for recording increases in the amount of the element
- · A space for recording decreases in the amount of the element

The account form that follows is called a **T account** because it resembles the letter T. The left side of the account is called the *debit* side, and the right side is called the *credit* side:¹

Tit	tle
Left side	Right side
debit	credit

¹ The terms *debit* and *credit* are derived from the Latin *debere* and *credere*.

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 ^ _		

NetSolutions' November Transactions

		Asse	ts		=	Liabilities	+		Stockholders' Equity									
						Accounts		Common				Fees		Wages	Rent	Supplies	Utilities	Misc.
	Cash	+ Sup	o. +	Land	=	Payable	+	Stock	-	Dividends	+	Earned	-	Exp.	Exp.	– Exp.	- Exp.	- Exp.
a.	+25,000							+25,000										
b.	-20,000			+20,000														
Bal.	5,000			20,000				25,000										
c.		+1,3	50			+1,350												
Bal.	5,000	1,3	50	20,000		1,350		25,000										
d.	+7,500		_									+7,500						
Bal.	12,500	1,3	50	20,000		1,350		25,000				7,500						
e.	_3,650		_											-2,125	<u>-800</u>		<u>-450</u>	-275
Bal.	8,850	1,3	50	20,000		1,350		25,000				7,500		-2,125	-800		-450	-275
f.	950					950												
Bal.	7,900	1,3	50	20,000		400		25,000				7,500		-2,125	-800		-450	-275
g.		8	00													<u>-800</u>		
Bal.	7,900	5	50	20,000		400		25,000				7,500		-2,125	-800	-800	-450	-275
h.	2,000		_							<u>-2,000</u>								
Bal.	5,900	5	50	20,000		<u>400</u>		25,000		_2,000		7,500		-2,125	<u>-800</u>	<u>-800</u>	<u>–450</u>	-275

The amounts shown in the Cash column of Exhibit 1 would be recorded in a cash account as follows:

		Ca	sh		
	(a)	25,000	(b)	20,000	
Debit	(d)	7,500	(e)	3,650	Credit
Side of	1		(f)	950	Side of
Account			(h)	2,000	Account
	Balance	5,900		<u> </u>	
Bala	nce of Accoun	t			

Note:

Amounts entered on the left side of an account are debits, and amounts entered on the right side of an account are credits.

Recording transactions in accounts must follow certain rules. For example, increases in assets are recorded on the **debit** (left side) of an account. Likewise, decreases in assets are recorded on the **credit** (right side) of an account. The excess of the debits of an asset account over its credits is the **balance of the account**.

To illustrate, the receipt (increase in Cash) of \$25,000 in transaction (a) is entered on the debit (left) side of the cash account. The letter or date of the transaction is also entered into the account. That way, if any questions later arise related to the entry, the entry can be traced back to the underlying transaction data. In contrast, the payment (decrease in Cash) of \$20,000 to purchase land in transaction (b) is entered on the credit (right) side of the account.

The balance of the cash account of \$5,900 is the excess of the debits over the credits, computed as follows:

Debits (\$25,000 + \$7,500)	\$32,500
Less credits (\$20,000 + \$3,650 + \$950 + \$2,000)	26,600
Balance of Cash as of November 30, 2015	\$ 5,900

The balance of the cash account is inserted in the account, in the Debit column. In this way, the balance is identified as a debit balance.² This balance represents NetSolutions' cash on hand as of November 30, 2015. This balance of \$5,900 is reported on the November 30, 2015, balance sheet for NetSolutions as shown in Exhibit 8 of Chapter 1.

In an actual accounting system, a more formal account form replaces the T account. Later in this chapter, a four-column account is illustrated. The T account, however, is

²The totals of the debit and credit columns may be shown separately in an account. When this is done, these amounts should be identified in some way so that they are not mistaken for entries or the ending balance of the account.

a simple way to illustrate the effects of transactions on accounts and financial statements. For this reason, T accounts are often used in business to explain transactions.

Each of the columns in Exhibit 1 can be converted into an account form in a similar manner as was done for the Cash column of Exhibit 1. However, as mentioned earlier, recording increases and decreases in accounts must follow certain rules. These rules are discussed after the chart of accounts is described.

Chart of Accounts

A group of accounts for a business entity is called a ledger. A list of the accounts in the ledger is called a chart of accounts. The accounts are normally listed in the order in which they appear in the financial statements. The balance sheet accounts are listed first, in the order of assets, liabilities, and stockholders' equity. The income statement accounts are then listed in the order of revenues and expenses.

Assets Assets are resources owned by the business entity. These resources can be physical items, such as cash and supplies, or intangibles that have value. Examples of intangible assets include patent rights, copyrights, and trademarks. Assets also include accounts receivable, prepaid expenses (such as insurance), buildings, equipment, and land.

Liabilities Liabilities are debts owed to outsiders (creditors). Liabilities are often identified on the balance sheet by titles that include *payable*. Examples of liabilities include accounts payable, notes payable, and wages payable. Cash received before services are delivered creates a liability to perform the services. These future service commitments are called *unearned revenues*. Examples of unearned revenues include magazine subscriptions received by a publisher and tuition received at the beginning of a term by a college.

Stockholders' equity Stockholders' equity is the stockholders' right to the assets of the business. Stockholders' equity is represented by the balance of the **common** stock and retained earnings accounts. A dividends account represents distributions of earnings to stockholders.

Revenues Revenues are increases in assets and stockholders' equity as a result of selling services or products to customers. Examples of revenues include fees earned, fares earned, commissions revenue, and rent revenue.



Business Connection

THE HIJACKING RECEIVABLE

A company's chart of accounts should reflect the basic nature of its operations. Occasionally, however, transactions take place that give rise to unusual accounts. The following is a story of one such account.

Before strict airport security was implemented across the United States, several airlines experienced hijacking incidents. One such incident occurred when a Southern Airways jet en route from Memphis to Miami was hijacked during a stopover in Birmingham, Alabama. The three hijackers boarded the plane in Birmingham armed with handguns and hand grenades. At gunpoint, the hijackers took the plane, the plane's crew, and the passengers to nine American cities, Toronto, and eventually to Havana, Cuba.

During the long flight, the hijackers demanded a ransom of \$10 million. Southern Airways, however, was only able to come up with \$2 million. Eventually, the pilot talked the hijackers into settling for the \$2 million when the plane landed in Chattanooga for refueling.

Upon landing in Havana, the Cuban authorities arrested the hijackers and, after a brief delay, sent the plane, passengers, and crew back to the United States. The hijackers and the \$2 million stayed in Cuba.

How did Southern Airways account for and report the hijacking payment in its subsequent financial statements? As you might have analyzed, the initial entry credited Cash for \$2 million. The debit was to an account entitled "Hijacking Payment." This account was reported as a type of receivable under "other assets" on Southern Airways' balance sheet. The company maintained that it would be able to collect the cash from the Cuban government and that, therefore, a receivable existed. In fact, Southern Airways was later repaid \$2 million by the Cuban government, which was, at that time, attempting to improve relations with the United States.

Expenses Expenses result from using up assets or consuming services in the process of generating revenues. Examples of expenses include wages expense, rent expense, utilities expense, supplies expense, and miscellaneous expense.

Illustration of Chart of Accounts A chart of accounts should meet the needs of a company's managers and other users of its financial statements. The accounts within the chart of accounts are numbered for use as references. A numbering system is normally used, so that new accounts can be added without affecting other account numbers.

Exhibit 2 is **NetSolutions**' chart of accounts that is used in this chapter. Additional accounts will be introduced in later chapters. In Exhibit 2, each account number has two digits. The first digit indicates the major account group of the ledger in which the account is located. Accounts beginning with 1 represent assets; 2, liabilities; 3, stockholders' equity; 4, revenue; and 5, expenses. The second digit indicates the location of the account within its group.



Balance Sheet Accounts

1. Assets

- 11 Cash
- 12 Accounts Receivable
- 14 Supplies
- 15 Prepaid Insurance
- 17 Land
- 18 Office Equipment

2. Liabilities

- 21 Accounts Payable
- 23 Unearned Rent

3. Stockholders' Equity

- 31 Common Stock
- 32 Retained Earnings
- 33 Dividends

Income Statement Accounts

4. Revenue

41 Fees Earned

5. Expenses

- 51 Wages Expense
- 52 Supplies Expense
- 53 Rent Expense
- 54 Utilities Expense
- 59 Miscellaneous Expense

EXHIBIT 2

Chart of Accounts for NetSolutions

Each of the columns in Exhibit 1 has been assigned an account number in the chart of accounts shown in Exhibit 2. In addition, Accounts Receivable, Prepaid Insurance, Office Equipment, and Unearned Rent have been added. These accounts will be used in recording NetSolutions' December transactions.

Double-Entry Accounting System

All businesses use what is called the **double-entry accounting system**. This system is based on the accounting equation and requires:

- Every business transaction to be recorded in at least two accounts.
- The total debits recorded for each transaction to be equal to the total credits recorded.

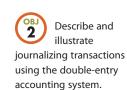
The double-entry accounting system also has specific **rules of debit and credit** for recording transactions in the accounts.

Balance Sheet Accounts

The debit and credit rules for balance sheet accounts are as follows:

Balance Sheet Accounts

	ETS ccounts				DERS' EQUITY Equity Accounts
Debit for	Credit for	Debit for	Credit for	Debit for	Credit for
increases (+)	decreases (–)	decreases (-)	increases (+)	decreases (-)	increases (+)



Income Statement Accounts

The debit and credit rules for income statement accounts are based on their relationship with stockholders' equity. As shown for balance sheet accounts, stockholders' equity accounts are increased by credits. Because revenues increase stockholders' equity, revenue accounts are increased by credits and decreased by debits. Because stockholders' equity accounts are decreased by debits, expense accounts are increased by debits and decreased by credits. Thus, the rules of debit and credit for revenue and expense accounts are as follows:

	Income Statement Accounts								
Revenue Accounts Expense Accounts									
Debit for	Credit for	Debit for	Credit for						
decreases (-)	increases (+)	increases (+)	decreases (–)						

Dividends

The debit and credit rules for recording dividends are based on the effect of dividends on stockholders' equity (retained earnings). Since dividends decrease stockholders' equity (retained earnings), the dividends account is increased by debits. Likewise, the dividends account is decreased by credits. Thus, the rules of debit and credit for the dividends account are as follows:

Dividen	ds Account
Debit for increases (+)	Credit for decreases (-)

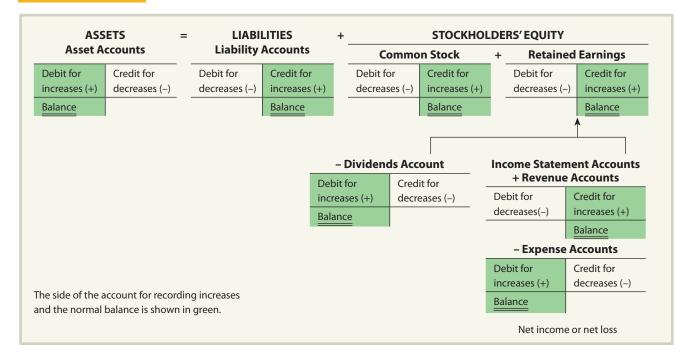
Normal Balances

The sum of the increases in an account is usually equal to or greater than the sum of the decreases in the account. Thus, the **normal balance of an account** is either a debit or credit depending on whether increases in the account are recorded as debits or credits. For example, because asset accounts are increased with debits, asset accounts normally have debit balances. Likewise, liability accounts normally have credit balances.

The rules of debit and credit and the normal balances of the various types of accounts are summarized in Exhibit 3. Debits and credits are sometimes abbreviated as Dr. for debit and Cr. for credit.

EXHIBIT 3

Rules of Debit and Credit, Normal Balances of Accounts



When an account normally having a debit balance has a credit balance, or vice versa, an error may have occurred or an unusual situation may exist. For example, a credit balance in the office equipment account could result only from an error. This is because a business cannot have more decreases than increases of office equipment. On the other hand, a debit balance in an accounts payable account could result from an overpayment.

Example Exercise 2-1 Rules of Debit and Credit and Normal Balances

ОВЈ **2**

State for each account whether it is likely to have (a) debit entries only, (b) credit entries only, or (c) both debit and credit entries. Also, indicate its normal balance.

- 1. Dividends
- 2. Accounts Payable
- 3. Cash

- 4. Fees Earned
- 5. Supplies
- 6. Utilities Expense

Follow My Example 2-1

- 1. Debit entries only; normal debit balance
- 2. Debit and credit entries; normal credit balance
- 3. Debit and credit entries; normal debit balance
- 4. Credit entries only; normal credit balance
- 5. Debit and credit entries; normal debit balance
- 6. Debit entries only; normal debit balance

Practice Exercises: PE 2-1A, PE 2-1B

Journalizing

Using the rules of debit and credit, transactions are initially entered in a record called a **journal**. In this way, the journal serves as a record of when transactions occurred and were recorded. To illustrate, the November transactions of **NetSolutions** from Chapter 1 are used.

A journal can be thought of as being similar to an

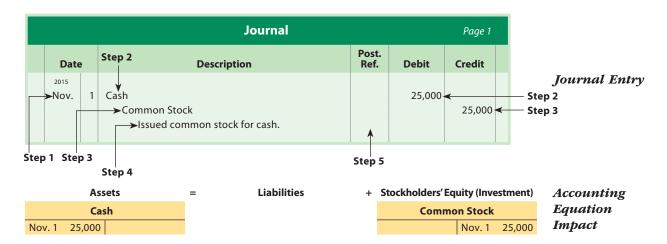
individual's diary of significant day-to-day life events.

Nov. 1 Chris Clark deposited \$25,000 in a bank account in the name of NetSolutions in exchange for common stock.

Transaction A

This transaction increases an asset account and increases an stockholders' equity account. It is recorded in the journal as an increase (debit) to Cash and an increase (credit) to Common Stock.

Analysis



The transaction is recorded in the journal using the following steps:

- Step 1. The date of the transaction is entered in the Date column.
- Step 2. The title of the account to be debited is recorded in the left-hand margin under the Description column, and the amount to be debited is entered in the Debit column.

- Step 3. The title of the account to be credited is listed below and to the right of the
 debited account title, and the amount to be credited is entered in the Credit
 column.
- Step 4. A brief description may be entered below the credited account.
- Step 5. The Post. Ref. (Posting Reference) column is left blank when the journal entry
 is initially recorded. This column is used later in this chapter when the journal
 entry amounts are transferred to the accounts in the ledger.

The process of recording a transaction in the journal is called **journalizing**. The entry in the journal is called a **journal entry**.

The following is a useful method for analyzing and journalizing transactions:

- Step 1. Carefully read the description of the transaction to determine whether an asset, a liability, an stockholders' equity, a revenue, an expense, or a dividends account is affected.
- Step 2. For each account affected by the transaction, determine whether the account increases or decreases.
- Step 3. Determine whether each increase or decrease should be recorded as a debit or a credit, following the rules of debit and credit shown in Exhibit 3.
- Step 4. Record the transaction using a journal entry.

Exhibit 4 summarizes terminology that is often used in describing a transaction along with the related accounts that would be debited and credited.

EXHIBIT 4

Transaction
Terminology and
Related Journal
Entry Accounts

	Journal Entry Account					
Common Transaction Terminology	Debit	Credit				
Received cash for services provided	Cash	Fees Earned				
Services provided on account	Accounts Receivable	Fees Earned				
Received cash on account	Cash	Accounts Receivable				
Purchased on account	Asset account	Accounts Payable				
Paid on account	Accounts Payable	Cash				
Paid cash	Asset or expense account	Cash				
Issued common stock	Cash and/or other assets	Common Stock				
Paid dividends	Dividends	Cash				

The remaining transactions of **NetSolutions** for November are analyzed and journalized next.

Transaction B Nov. 5 NetSolutions paid \$20,000 for the purchase of land as a future building site.

Analysis

This transaction increases one asset account and decreases another. It is recorded in the journal as a \$20,000 increase (debit) to Land and a \$20,000 decrease (credit) to Cash.

Journal Entry

Nov. 5 Land Cash Purchased land for building site.		20,000	20,000		
--	--	--------	--------	--	--

Liabilities

Accounting Equation Impact

Land							
Nov. 5	20,000						
	Ca	sh					
		Nov. 5	20,000				

Assets

+ Stockholders' Equity

This transaction increas	chased supplies on account f	for \$1,3	50.			Transaction C
is recorded in the journ increase (credit) to Acc		Analysis				
Nov. 10 Supplies Accounts Purchas	'ayable sed supplies on account.		1,350	1,350		Journal Entry
Assets Supplies Nov. 10 1,350	= Liabilities Accounts Payable Nov. 10 1,350	+	Stockhold	lers' Equity	,	Accounting Equation Impact
ov. 18 NetSolutions rece	rived cash of \$7,500 from cu	stomers	for servi	ces provi	ided.	Transaction D
	ses an asset account and in urnal as a \$7,500 increase (c s Earned.					Analysis
Nov. 18 Cash Fees Earne Receive	d ed fees from customers.		7,500	7,500		Journal Entry
Assets Cash Nov. 18 7,500	= Liabilities	+ Sto	ckholders' E Fees I	Equity (Rev Earned Nov. 18		Accounting Equation Impact
	irred the following expenses:	wages,	\$2,125;	rent, \$80	00;	Transaction E
	nd miscellaneous, \$275.					
(Cash) account. You she sum of the debits is alwa- recorded in the journal Expense, \$2,125; Rent E	ses various expense accourd ould note that regardless of the ays equal to the sum of the crewith increases (debits) to the expense, \$800; Utilities Expendecrease (credit) to Cash, \$3,	the numedits in e expenses, \$450	iber of ac <i>a journal</i> ise accou	counts, a l entry. I nts (Waş	the t is ges	Analysis
(Cash) account. You she sum of the debits is always recorded in the journal Expense, \$2,125; Rent Expense, \$275) and a control of the Expense (Sent Expense Utilities Expense (Miscellaneous Cash)	ould note that regardless of tays equal to the sum of the crewith increases (debits) to the expense, \$800; Utilities Expendecrease (credit) to Cash, \$3,	the numedits in e expenses, \$450	iber of ac <i>a journal</i> ise accou	counts, a l entry. I nts (Waş	the t is ges	Analysis Journal Entry
(Cash) account. You she sum of the debits is always recorded in the journal Expense, \$2,125; Rent Expense, \$275) and a control of the Expense (Sent Expense Utilities Expense (Miscellaneous Cash)	ould note that regardless of tays equal to the sum of the crewith increases (debits) to the expense, \$800; Utilities Expendecrease (credit) to Cash, \$3, espense Expense Liabilities	the numedits in experience experience experience (650.	aber of ac a journal ase accou); and Mis 2,125 800 450 275	acounts, a lentry. In the lentry of the lent	the t is ges ous	
(Cash) account. You she sum of the debits is alware recorded in the journal Expense, \$2,125; Rent Expense, \$275) and a compart of the sum of the debits is alware recorded in the journal Expense, \$275) and a compared to the sum of t	ould note that regardless of tays equal to the sum of the crewith increases (debits) to the expense, \$800; Utilities Expendecrease (credit) to Cash, \$3, espense Expense Liabilities	the numedits in experience experience experience (650.	a journal ase accou b; and Mis 2,125 800 450 275 ckholders' E Wages .30 2,125	acounts, a lentry. In the lentry of the lent	the t is ges ous	Journal Entry Accounting Equation
(Cash) account. You she sum of the debits is alware recorded in the journal Expense, \$2,125; Rent Expense, \$275) and a compart of the sum of the debits is alware recorded in the journal Expense, \$275) and a compared to the sum of t	ould note that regardless of tays equal to the sum of the crewith increases (debits) to the expense, \$800; Utilities Expendecrease (credit) to Cash, \$3, espense Expense Liabilities	the numedits in experience experience experience (650.	a journal ase accou b; and Mis 2,125 800 450 275 ckholders' I Wages 30 2,125 Rent E	accounts, a lentry. It entry. It entry. It is (Waş scellaned) 3,650 Equity (Expense	the t is ges ous	Journal Entry Accounting Equation
(Cash) account. You she sum of the debits is always recorded in the journal Expense, \$2,125; Rent Expense, \$275) and a compact of the sum of the debits is always recorded in the journal Expense, \$275) and a compact of the sum of th	ould note that regardless of tays equal to the sum of the crewith increases (debits) to the expense, \$800; Utilities Expendecrease (credit) to Cash, \$3, espense Expense Liabilities	the numedits in experise, \$456,650.	a journal ase accou b; and Mis 2,125 800 450 275 ckholders' E Wages 30 2,125 Rent E 30 800 Utilities	accounts, a lentry. It entry. It entry. It is (Waş scellaned) 3,650 Equity (Expense Expense	the t is ges ous	Journal Entry Accounting Equation
(Cash) account. You she sum of the debits is alware recorded in the journal Expense, \$2,125; Rent Expense, \$275) and a compart of the sum of the debits is alware recorded in the journal Expense, \$275) and a compared to the sum of t	ould note that regardless of tays equal to the sum of the crewith increases (debits) to the expense, \$800; Utilities Expendecrease (credit) to Cash, \$3, espense Expense Liabilities	the numedits in experise, \$456,650.	a journal ase accou b; and Mis 2,125 800 450 275 ckholders' E Wages 30 2,125 Rent E 30 800 Utilities 30 450 Miscellanee	accounts, a lentry. In the lentry. In the lentry in the le	ense)	Journal Entry Accounting Equation

Transaction F

Nov. 30 NetSolutions paid creditors on account, \$950.

Analysis

This transaction decreases a liability account and decreases an asset account. It is recorded in the journal as a \$950 decrease (debit) to Accounts Payable and a \$950 decrease (credit) to Cash.

Journal Entry

	Nov.	30	Accounts Payable Cash Paid creditors on account.		950	950	
--	------	----	--	--	-----	-----	--

Accounting Equation Impact

Ass	ets		=		Liabi	lities	+	Stockholders' Equity
Ca	sh			Ad	counts	Payable		
	Nov. 30	950		Nov. 30	950			

Transaction G

Nov. 30 NetSolutions determined that the cost of supplies on hand at November 30 was \$550.

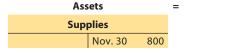
Analysis

NetSolutions purchased \$1,350 of supplies on November 10. Thus, \$800 (\$1,350 – \$550) of supplies must have been used during November. This transaction is recorded in the journal as an \$800 increase (debit) to Supplies Expense and an \$800 decrease (credit) to Supplies.

Journal Entry

Liabilities

Accounting Equation Impact



+ Stockholders' Equity (Expense)

Supplies Expense

Nov. 30 800

Transaction H

Nov. 30 Paid dividends, \$2,000.

Analysis

This transaction decreases assets and stockholders'equity. This transaction is recorded in the journal as a \$2,000 increase (debit) to Dividends and a \$2,000 decrease (credit) to Cash.

Journal Entry

		Journal			Page
Date		Description	Post. Ref.	Debit	Credit
Nov. 3	30	Dividends Cash Paid dividends.		2,000	2,000

Accounting Equation Impact Assets

Cash

Nov. 30 2,000

Liabilities

Stockholders' Equity (Dividends)

Dividends

Nov. 30 2,000

Integrity, Objectivity, and Ethics in Business



WILL JOURNALIZING PREVENT FRAUD?

While journalizing transactions reduces the possibility of fraud, it by no means eliminates it. For example, embezzlement can be hidden within the double-entry book-

keeping system by creating fictitious suppliers to whom checks are issued.

Examp	le Exercise 2-2 Journal Entry for Asset Purchas	e 2					
Prepare a journal entry for the purchase of a truck on June 3 for \$42,500, paying \$8,500 cash and the remainder on account.							
Follow	Follow My Example 2-2						
June 3	Truck	. 42,500					
	Cash	. 8,500					
	Accounts Payable	. 34,000					
• • • • • • • • • • • • • • • • • • • •		Practice Evercises: PE 2-24 PE 2-28					

Posting Journal Entries to Accounts

As illustrated, a transaction is first recorded in a journal. Periodically, the journal entries are transferred to the accounts in the ledger. The process of transferring the debits and credits from the journal entries to the accounts is called **posting**.

Describe and illustrate the journalizing and posting of transactions to accounts.

The December transactions of **NetSolutions** are used to illustrate posting from the journal to the ledger. By using the December transactions, an additional review of analyzing and journalizing transactions is provided.

Dec. 1 NetSolutions paid a premium of \$2,400 for an insurance policy for liability, theft, and fire. The policy covers a one-year period.

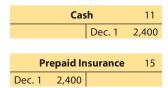
Transaction

Advance payments of expenses, such as for insurance premiums, are called prepaid expenses. Prepaid expenses are assets. For NetSolutions, the asset purchased is insurance protection for 12 months. This transaction is recorded as a \$2,400 increase (debit) to Prepaid Insurance and a \$2,400 decrease (credit) to Cash.

Analysis



Journal Entry



Accounting Equation Impact

The posting of the preceding December 1 transaction is shown in Exhibit 5. Notice that the T account form is not used in Exhibit 5. In practice, the T account is usually replaced with a standard account form similar to that shown in Exhibit 5.

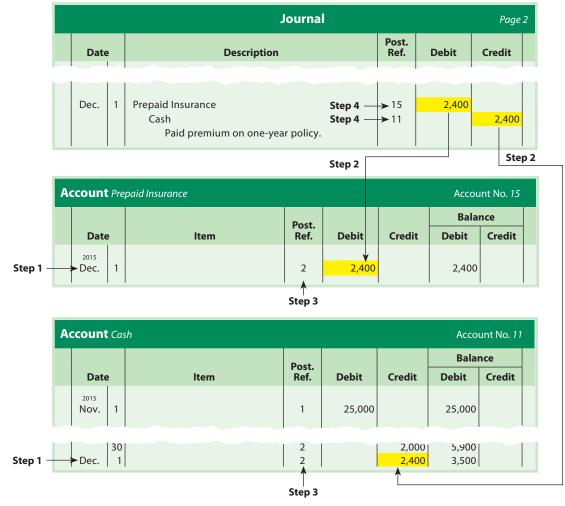
The debits and credits for each journal entry are posted to the accounts in the order in which they occur in the journal. To illustrate, the debit portion of the December 1 journal entry is posted to the prepaid account in Exhibit 5 using the following four steps:

- Step 1. The date (Dec. 1) of the journal entry is entered in the Date column of Prepaid Insurance.
- Step 2. The amount (2,400) is entered into the Debit column of Prepaid Insurance.
- Step 3. The journal page number (2) is entered in the Posting Reference (Post. Ref.) column of Prepaid Insurance.
- Step 4. The account number (15) is entered in the Posting Reference (Post. Ref.) column in the journal.

As shown in Exhibit 5, the credit portion of the December 1 journal entry is posted to the cash account in a similar manner.

EXHIBIT 5

Diagram of the Recording and Posting of a Debit and a Credit



The remaining December transactions for **NetSolutions** are analyzed and journalized in the following paragraphs. These transactions are posted to the ledger later in this chapter (see Exhibit 6). To simplify, some of the December transactions are stated in summary form. For example, cash received for services is normally recorded on a daily basis. However, only summary totals are recorded at the middle and end of the month for NetSolutions.

Transaction

Dec. 1 NetSolutions paid rent for December, \$800. The company from which NetSolutions is renting its office space now requires the payment of rent on the first of each month, rather than at the end of the month.

Analysis

The advance payment of rent is an asset, much like the advance payment of the insurance premium in the preceding transaction. However, unlike the insurance premium, this prepaid rent will expire in one month. When an asset is purchased with the expectation that it will be used up in a short period of time, such as a month, it is normal to debit an expense account initially. This avoids having to transfer the balance from an asset account (Prepaid Rent) to an expense account (Rent Expense) at the end of the month. Thus, this transaction is recorded as an \$800 increase (debit) to Rent Expense and an \$800 decrease (credit) to Cash.

Journal Entry

Dec.

Assets		=	Liabilities +	Stockho	olders' Equity (Ex	pense)	Accounting
Cash	11				Rent Expense	53	Equation
Dec. 1	800			Dec. 1	800		Impact

Dec. 1 NetSolutions received an offer from a local retailer to rent the land purchased on November 5. The retailer plans to use the land as a parking lot for its employees and customers. NetSolutions agreed to rent the land to the retailer for three months, with the rent payable in advance. NetSolutions received \$360 for three months' rent beginning December 1.

Transaction

By agreeing to rent the land and accepting the \$360, NetSolutions has incurred an obligation (liability) to the retailer. This obligation is to make the land available for use for three months and not to interfere with its use. The liability created by receiving the cash in advance of providing the service is called unearned revenue. As time passes, the unearned rent liability will decrease and will become revenue. Thus, this transaction is recorded as a \$360 increase (debit) to Cash and a \$360 increase (credit) to Unearned Rent.

Analysis

	Dec.	1		ed ad	vance payment i t on land.	for three		11 23	360	360		Journal Entry
	A	sset	ts	=	Liabi	lities		+	Stockhol	ders' Equit	y	Accounting
	C	ash	11		Unearne	d Rent	23					Equation
Dec. 1	36	0				Dec. 1	360					Impact



Business Connection

MICROSOFT'S UNEARNED REVENUE

Microsoft Corporation develops, manufactures, licenses, and supports a wide range of computer software products, including Windows 7°, Windows 8°, Word°, Excel°, and the Xbox® gaming system. When Microsoft sells its products, it also provides technical support and periodic updates on those products for a period of time. Thus, at the time of sale a portion of the proceeds is unearned (deferred) for these services. As time passes and services are provided to customers, Microsoft records a portion of its unearned (deferred) revenue as revenue.3

To illustrate, the following excerpts were taken from recent financial statement of Microsoft:

Unearned revenue comprises mainly unearned revenue from volume licensing programs, and payments for offerings for which we have been paid in advance and we earn the revenue when we provide the service or software or otherwise meet the revenue recognition criteria.... Also included in unearned revenue are payments for post-delivery support and consulting services to be performed in the future....

Unearned revenue (in millions) by segment:

	current year	prior year
Windows Division	\$ 2,086	\$ 2,444
Server and Tools	8,639	7,445
Microsoft Business Division	10,142	9,015
Other segments	1,532	1,155
Total	\$22,399	\$20,059

During the year, Microsoft recognized \$44.25 billion in unearned revenue as revenue. At the same time, Microsoft recorded additional unearned revenue from the current period of \$41.92 billion. Out of \$77.8 billion in total revenue, Microsoft recognized \$44.2 billion from unearned revenue, or 56% of total revenues. Thus, unearned revenues are a significant reporting item for Microsoft.

Source: Microsoft Corp., Form 10-K for the Fiscal Year Ended June 30, 2013.

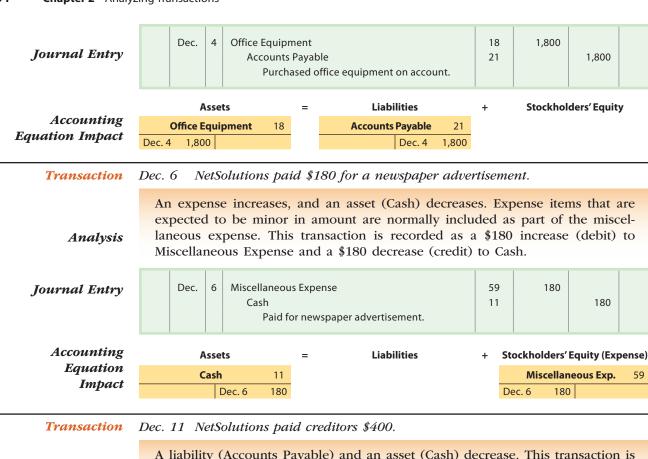
Dec. 4 NetSolutions purchased office equipment on account from Executive Supply Co. for \$1,800.

Transaction

The asset (Office Equipment) and liability accounts (Accounts Payable) increase. This transaction is recorded as an \$1,800 increase (debit) to Office Equipment and an \$1,800 increase (credit) to Accounts Payable.

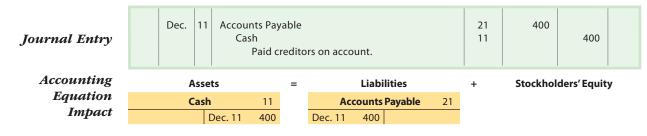
Analysis

³ Separating unearned revenue from the initial sale of a product or service is consistent with FASB Exposure Draft, Revenue Recognition (Topic 605), June 24, 2010, paras. 23, 35-36.



Analysis

A liability (Accounts Payable) and an asset (Cash) decrease. This transaction is recorded as a \$400 decrease (debit) to Accounts Payable and a \$400 decrease (credit) to Cash.



Transaction

Dec. 13 NetSolutions paid a receptionist and a part-time assistant \$950 for two weeks' wages.

Analysis

This transaction is similar to the December 6 transaction, where an expense account is increased and Cash is decreased. This transaction is recorded as a \$950 increase (debit) to Wages Expense and a \$950 decrease (credit) to Cash.

	Journal Page 3								3
	Date	2		De	cription	Post. Ref.	Debit	Credit	
Journal Entry	2015								
Journal Liniy	Dec. 13 Wages Expense					51	950		
			Cash	<i>5</i> ,				950	
			Paid two	weeks	wages.				
Accounting		As	sets	=	Liabilities	+	Stockholde	rs' Equity (E	хр
Equation		Ca	sh 11				Wag	es Expense	
Impact			Dec. 13 950				Dec. 13	950	



Business Connection

COMPUTERIZED ACCOUNTING SYSTEMS

Computerized accounting systems are widely used by even the smallest companies. These systems simplify the record-keeping process in that transactions are recorded in electronic forms. Forms used to bill customers for services provided are often completed using drop-down menus that list services that are normally provided to customers. An auto-complete entry feature may also be used to fill in customer names. For example, type "ca" to display customers with names beginning with "Ca" (Caban, Cahill, Carey, and Caswell). And, to simplify data entry, entries are automatically posted to the ledger accounts when the electronic form is completed. One popular accounting software package used by small- to medium-sized businesses is OuickBooks°.

Dec. 16 NetSolutions received \$3,100 from fees earned for the first half of December.

Transaction

An asset account (Cash) and a revenue account (Fees Earned) increase. This transaction is recorded as a \$3,100 increase (debit) to Cash and a \$3,100 increase (credit) to Fees Earned.

Analysis

	Dec. 16	Cash Fees Earned Received fees from customers.	11 41	3,100	3,100		
--	---------	--	----------	-------	-------	--	--

Journal Entry

Assets Cash 11 Dec. 16 3,100

Liabilities Stockholders' Equity (Revenue)

> **Fees Earned** Dec. 16 3,100

Accounting **Equation Impact**

Dec. 16 Fees earned on account totaled \$1,750 for the first half of December.

Transaction

When a business agrees that a customer may pay for services provided at a later date, an account receivable is created. An account receivable is a claim against the customer. An account receivable is an asset, and the revenue is earned even though no cash has been received. Thus, this transaction is recorded as a \$1,750 increase (debit) to Accounts Receivable and a \$1,750 increase (credit) to Fees Earned.

Analysis



Journal Entry

Assets **Accounts Receivable** Dec. 16 1,750

Stockholders' Equity (Revenue) **Fees Earned** Dec. 16 1,750 Accounting **Equation Impact**

Example Exercise 2-3 Journal Entry for Fees Earned

Prepare a journal entry on August 7 for the fees earned on account, \$115,000.

Follow My Example 2-3

Accounts Receivable..... Aug. 7

Fees Farned 115,000

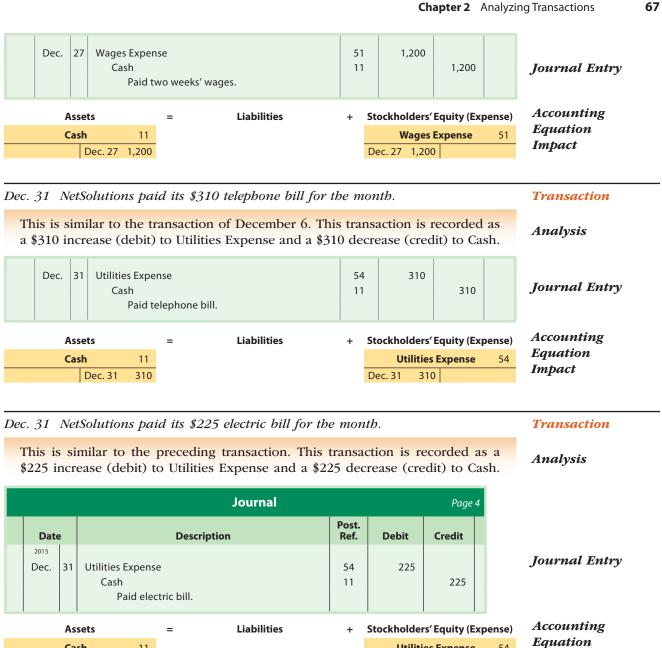
Practice Exercises: PE 2-3A, PE 2-3B

Transaction Dec. 20 NetSolutions paid \$900 to Executive Supply Co. on the \$1,800 debt owed from the December 4 transaction. This is similar to the transaction of December 11. This transaction is recorded as Analysis a \$900 decrease (debit) to Accounts Payable and a \$900 decrease (credit) to Cash. **Accounts Payable** 21 900 Dec. 20 Cash 11 900 Journal Entry Paid creditors on account. Accounting **Assets** Liabilities Stockholders' Equity **Equation** Cash 11 **Accounts Payable** 21 **Impact** Dec. 20 900 Dec. 20 900 **Transaction** Dec. 21 NetSolutions received \$650 from customers in payment of their accounts. When customers pay amounts owed for services they have previously received, one asset increases and another asset decreases. This transaction is recorded Analysis as a \$650 increase (debit) to Cash and a \$650 decrease (credit) to Accounts Receivable. Cash 650 Dec. 21 11 Journal Entry Accounts Receivable 12 650 Received cash from customers on account. Accounting Liabilities Stockholders' Equity **Assets Equation** Cash 11 **Impact** Dec. 21 650 **Accounts Receivable** 12 Dec. 21 650 **Transaction** Dec. 23 NetSolutions paid \$1,450 for supplies. One asset account (Supplies) increases, and another asset account (Cash) decreases. This transaction is recorded as a \$1,450 increase (debit) to Supplies Analysis and a \$1,450 decrease (credit) to Cash. Dec. 23 Supplies 14 1,450 Journal Entry 11 1,450 Purchased supplies. Accounting Liabilities **Assets** Stockholders' Equity **Equation** Cash 11 **Impact** Dec. 23 1,450 **Supplies** 14 Dec. 23 1,450

Transaction Dec. 27 NetSolutions paid the receptionist and the part-time assistant \$1,200 for two weeks' wages.

Analysis

This transaction is similar to the transaction of December 13. This transaction is recorded as a \$1,200 increase (debit) to Wages Expense and a \$1,200 decrease (credit) to Cash.



Assets		=	Liabilities	+	Stockholders' Equity (Expense	'	unting
Cash	11				Utilities Expense 54	Equa	
Dec. 31	225				Dec. 31 225	Ітра	ct

Dec. 31 NetSolutions received \$2,870 from fees earned for the second half of **Transaction** December. This is similar to the transaction of December 16. This transaction is recorded as Analysis a \$2,870 increase (debit) to Cash and a \$2,870 increase (credit) to Fees Earned. Dec. 31 Cash 11 2,870 Fees Earned 41 2,870 Journal Entry Received fees from customers. Accounting Liabilities Stockholders' Equity (Revenue) Assets **Equation** Cash 11 **Fees Earned Impact** Dec. 31 2,870 Dec. 31 2,870

Transaction

Dec. 31 Fees earned on account totaled \$1,120 for the second half of December.

Analysis

This is similar to the transaction of December 16. This transaction is recorded as a \$1,120 increase (debit) to Accounts Receivable and a \$1,120 increase (credit) to Fees Earned.

Journal Entry

Dec. 31 Accounts Receivable 12 Fees Earned 41 Fees earned on account.	1,120	
---	-------	--

Accounting Equation Impact

Assets						
Acc	ounts R	eceivable	12			
Dec. 31	1,120					

Liabilities

Stockholders' Equity (Revenue)

Fees Earned 41

Dec. 31 1,120

Transaction Dec. 31 Paid dividends, \$2,000.

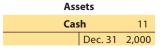
Analysis

This transaction decreases stockholders' equity and assets. This transaction is recorded as a \$2,000 increase (debit) to Dividends and a \$2,000 decrease (credit) to Cash.

Journal Entry

Dec.	31	Dividends Cash Paid dividends.	33 11	2,000	2,000	
------	----	--------------------------------------	----------	-------	-------	--

Accounting Equation Impact



Liabilities

Stockhol	ders' Ec	luity (Div	ridends)
	Divide	ends	33
Dec. 31	2,000		

Example Exercise 2-4 Journal Entry for Dividends

Prepare a journal entry on December 29 for the payment of \$12,000 of dividends.

Follow My Example 2-4

 Dec. 29
 Dividends
 12,000

 Cash
 12,000

Practice Exercises: PE 2-4A, PE 2-4B

Example Exercise 2-5 Missing Amount from an Account



On March 1, the cash account balance was \$22,350. During March, cash receipts totaled \$241,880, and the March 31 balance was \$19,125. Determine the cash payments made during March.

Follow My Example 2-5

Using the following T account, solve for the amount of cash payments (indicated by ?):

	Cas	h	
Mar. 1 Bal.	22,350	?	Cash payments
Cash receipts	241,880		
Mar. 31 Bal.	19.125		

\$19,125 = \$22,350 + \$241,880 - Cash paymentsCash payments = \$22,350 + \$241,880 - \$19,125 = \$245,105

Practice Exercises: PE 2-5A, PE 2-5B

Exhibit 6 shows the ledger for **NetSolutions** after the transactions for both November and December have been posted.

EXHIBIT 6

Cash Receipts Journal for a Merchandising Business

			Ledger								
Account Cash Account No. 11											
					Bala	ance					
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit					
2015			25.000		25.000						
Nov. 1		1	25,000		25,000						
5		1		20,000	5,000						
18		1	7,500		12,500						
30		1		3,650	8,850						
30		1		950	7,900						
30		2		2,000	5,900						
Dec. 1		2		2,400	3,500						
1		2		800	2,700						
1		2	360		3,060						
6		2		180	2,880						
11		2		400	2,480						
13		3		950	1,530						
16		3	3,100		4,630						
20		3		900	3,730						
21		3	650		4,380						
23		3		1,450	2,930						
27		3		1,200	1,730						
31		3		310	1,420						
31		4		225	1,195						
31		4	2,870		4,065						
31		4		2,000	2,065						

Accou	I nt Land				Account	No. 17
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015 Nov. 5		1	20,000		20,000	

Accou	int Office Equ	Account	No. 18			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Dec. 4		2	1,800		1,800	

Accou	Int Accounts	Account No. 21				
			Balance			
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 10		1		1,350		1,350
30		1	950			400
Dec. 4		2		1,800		2,200
11		2	400			1,800
20		3	900			900

Account Accounts Receivable Account No. 12									
					Bala	nce			
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit			
2015									
Dec. 16		3	1,750		1,750				
21		3		650	1,100				
31		4	1,120		2,220				

Accou	nt Unearne	Account No. 23				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Dec. 1		2		360		360

Accou	i nt Supplies		Account	No. 14		
					Bala	ance
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 10		1	1,350		1,350	
30		1		800	550	
Dec. 23		3	1,450		2,000	

Accou	I nt Common	Account No. 31				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Nov. 1		1		25,000		25,000

Accou	I nt Prepaid I	Account	No. 15				
					Balance		
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit	
2015 Dec. 1		2	2,400		2,400		

Accou	I nt Dividend.	Account No. 33				
					Balance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 30		2	2,000		2,000	
Dec. 31		4	2,000		4,000	

(Continued)

EXHIBIT 6

Cash Receipts Journal for a Merchandising Business (Concluded)

Accou	I nt Fees Earn	Account No. 41				
		Bala	nce			
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 18		1		7,500		7,500
Dec. 16		3		3,100		10,600
16		3		1,750		12,350
31		4		2,870		15,220
31		4		1,120		16,340

Account Rent Expense					Account	No. 53
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015 Nov. 30		1	800		800	
Dec. 1		2	800		1,600	
					,	

Accou	int Wages Ex	Account	No. 51			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 30		1	2,125		2,125	
Dec. 13		3	950		3,075	
27		3	1,200		4,275	

Accou	i nt Utilities E.	Account No. 54				
						nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 30		1	450		450	
Dec. 31		3	310		760	
31		4	225		985	

Account Supplies Expense						No. 52
		Balance				ince
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Nov. 30		1	800		800	

Account Miscellaneous Expense Account No. 59							
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov. 30		1	275		275		
Dec. 6		2	180		455		



discover errors.

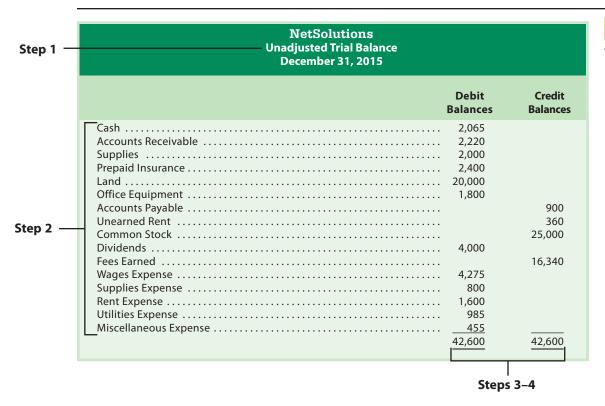
Trial Balance

Errors may occur in posting debits and credits from the journal to the ledger. One way to detect such errors is by preparing a **trial balance**. Double-entry accounting requires that debits must always equal credits. The trial balance verifies this equality. The steps in preparing a trial balance are as follows:

- Step 1. List the name of the company, the title of the trial balance, and the date the trial balance is prepared.
- Step 2. List the accounts from the ledger, and enter their debit or credit balance in the Debit or Credit column of the trial balance.
- Step 3. Total the Debit and Credit columns of the trial balance.
- Step 4. Verify that the total of the Debit column equals the total of the Credit column.

The trial balance for **NetSolutions** as of December 31, 2015, is shown in Exhibit 7. The account balances in Exhibit 7 are taken from the ledger shown in Exhibit 6. Before a trial balance is prepared, each account balance in the ledger must be determined. When the standard account form is used as in Exhibit 6, the balance of each account appears in the balance column on the same line as the last posting to the account.

The trial balance shown in Exhibit 7 is titled an **unadjusted trial balance**. This is to distinguish it from other trial balances that will be prepared in later



chapters. These other trial balances include an adjusted trial balance and a post-closing trial balance.⁴

Errors Affecting the Trial Balance

If the trial balance totals are not equal, an error has occurred. In this case, the error must be found and corrected. A method useful in discovering errors is as follows:

- 1. If the difference between the Debit and Credit column totals is 10, 100, or 1,000, an error in addition may have occurred. In this case, re-add the trial balance column totals. If the error still exists, recompute the account balances.
- 2. If the difference between the Debit and Credit column totals can be evenly divisible by 2, the error may be due to the entering of a debit balance as a credit balance, or vice versa. In this case, review the trial balance for account balances of one-half the difference that may have been entered in the wrong column. For example, if the Debit column total is \$20,640 and the Credit column total is \$20,236, the difference of \$404 (\$20,640 \$20,236) may be due to a credit account balance of \$202 that was entered as a debit account balance.
- 3. If the difference between the Debit and Credit column totals is evenly divisible by 9, trace the account balances back to the ledger to see if an account balance was incorrectly copied from the ledger. Two common types of copying errors are transpositions and slides. A **transposition** occurs when the order of the digits is copied incorrectly, such as writing \$542 as \$452 or \$524. In a **slide**, the entire number is copied incorrectly one or more spaces to the right or the left, such as writing \$542.00 as \$54.20 or \$5,420.00. In both cases, the resulting error will be evenly divisible by 9.
- 4. If the difference between the Debit and Credit column totals is not evenly divisible by 2 or 9, review the ledger to see if an account balance in the amount of the error has been omitted from the trial balance. If the error is not discovered, review the journal postings to see if a posting of a debit or credit may have been omitted.

EXHIBIT 7

Trial Balance

⁴ The adjusted trial balance will be discussed in Chapter 3 and the post-closing trial balance in Chapter 4.

5. If an error is not discovered by the preceding steps, the accounting process must be retraced, beginning with the last journal entry.

The trial balance does not provide complete proof of the accuracy of the ledger. It indicates only that the debits and the credits are equal. This proof is of value, however, because errors often affect the equality of debits and credits.

Example Exercise 2-6 Trial Balance Errors



For each of the following errors, considered individually, indicate whether the error would cause the trial balance totals to be unequal. If the error would cause the trial balance totals to be unequal, indicate whether the debit or credit total is higher and by how much.

- a. Payment of dividends of \$5,600 was journalized and posted as a debit of \$6,500 to Salary Expense and a credit of \$6,500 to Cash.
- b. A fee of \$2,850 earned from a client was debited to Accounts Receivable for \$2,580 and credited to Fees Earned for \$2,850.
- c. A payment of \$3,500 to a creditor was posted as a debit of \$3,500 to Accounts Payable and a debit of \$3,500 to Cash.

.....

Follow My Example 2-6

- a. The totals are equal since both the debit and credit entries were journalized and posted for \$6,500.
- b. The totals are unequal. The credit total is higher by \$270 (\$2,850 \$2,580).
- c. The totals are unequal. The debit total is higher by \$7,000 (\$3,500 + \$3,500).

Practice Exercises: PE 2-6A, PE 2-6B

Errors Not Affecting the Trial Balance

An error may occur that does not cause the trial balance totals to be unequal. Such an error may be discovered when preparing the trial balance or may be indicated by an unusual account balance. For example, a credit balance in the supplies account indicates an error has occurred. This is because a business cannot have "negative" supplies. When such errors are discovered, they should be corrected. If the error has already been journalized and posted to the ledger, a **correcting journal entry** is normally prepared.

To illustrate, assume that on May 5 a \$12,500 purchase of office equipment on account was incorrectly journalized and posted as a debit to Supplies and a credit to Accounts Payable for \$12,500. This posting of the incorrect entry is shown in the following T accounts:

Incorrect:



Before making a correcting journal entry, it is best to determine the debit(s) and credit(s) that should have been recorded. These are shown in the following T accounts:

Correct:



Comparing the two sets of T accounts shows that the incorrect debit to Supplies may be corrected by debiting Office Equipment for \$12,500 and crediting Supplies for \$12,500. The following correcting entry is then journalized and posted:

May	31	Office Equipment Supplies To correct erroneous debit	18 14	12,500	12,500	
		to Supplies on May 5. See invoice from Bell Office Equipment Co.				

Example Exercise 2-7 Correcting Entries



The following errors took place in journalizing and posting transactions:

- a. Dividends of \$6,000 were recorded as a debit to Office Salaries Expense and a credit to Cash.
- b. Utilities Expense of \$4,500 paid for the current month was recorded as a debit to Miscellaneous Expense and a credit to Accounts Payable.

Journalize the entries to correct the errors. Omit explanations.

Follow My Example 2-7

a.	Dividends	6,000	
	Office Salaries Expense		6,000
b.	Accounts Payable	4,500	
	Miscellaneous Expense		4,500
	Utilities Expense	4,500	
	Cash		4,500

Note: The first entry in (b) reverses the incorrect entry, and the second entry records the correct entry. These two entries could also be combined into one entry; however, preparing two entries will make it easier for someone later to understand what happened and why the entries were necessary.

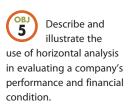
Practice Exercises: PE 2-7A, PE 2-7B

Financial Analysis and Interpretation: Horizontal Analysis

A single item in a financial statement, such as net income, is often useful in interpreting the financial performance of a company. However, a comparison with prior periods often makes the financial information even more useful. For example, comparing net income of the current period with the net income of the prior period will indicate whether the company's operating performance has improved.

In **horizontal analysis**, the amount of each item on a current financial statement is compared with the same item on an earlier statement. The increase or decrease in the *amount* of the item is computed together with the *percent* of increase or decrease. When two statements are being compared, the earlier statement is used as the base for computing the amount and the percent of change.

To illustrate, the horizontal analysis of two income statements for J. Holmes, Attorneyat-Law follows:





J. Holmes, Attorney-at-Law
Income Statements
For the Years Ended December 31

			Increase (Decrease)
	Year 2	Year 1	Amount	Percent
Fees earned	\$187,500	\$150,000	\$37,500	25.0%*
Operating expenses:				
Wages expense	\$ 60,000	\$ 45,000	\$15,000	33.3
Rent expense	15,000	12,000	3,000	25.0
Utilities expense	12,500	9,000	3,500	38.9
Supplies expense	2,700	3,000	(300)	(10.0)
Miscellaneous expense	2,300	1,800	500	27.8
Total operating expenses	\$ 92,500	\$ 70,800	\$21,700	30.6
Net income	\$ 95,000	\$ 79,200	\$15,800	19.9

^{*\$37,500 ÷ \$150,000}

The horizontal analysis for J. Holmes, Attorney-at-Law, indicates both favorable and unfavorable trends. The increase in fees earned is a favorable trend, as is the decrease in supplies expense. Unfavorable trends include the increase in wages expense, utilities expense, and miscellaneous expense. These expenses increased the same as or faster than the increase in revenues, with total operating expenses increasing by 30.6%. Overall, net income increased by \$15,800, or 19.9%, a favorable trend.

The significance of the various increases and decreases in the revenue and expense items should be investigated to see if operations could be further improved. For example, the increase in utilities expense of 38.9% was the result of renting additional office space for use by a part-time law student in performing paralegal services. This explains the increase in rent expense of 25.0% and the increase in wages expense of 33.3%. The increase in revenues of 25.0% reflects the fees generated by the new paralegal.

The preceding example illustrates how horizontal analysis can be useful in interpreting and analyzing the income statement. Horizontal analyses can also be performed for the balance sheet, the retained earnings statement, and the statement of cash flows.

To illustrate, horizontal analysis for two recent years of Apple Inc.'s statements of cash flows (in millions) follows:

Apple Inc.
Statements of Cash Flows

				ease rease)
	Year 2	Year 1	Amount	Percent
Cash flows from operating activities	\$ 50,856	\$37,529	\$13,327	35.5%
Cash flows used for investing activities	(48,227)	(40,419)	(7,808)	(19.3)
Cash flows from financing activities	(1,698)	1,444	(3,142)	(217.6)
Net increase (decrease) in cash	\$ 931	\$ (1,446)	\$ 2,377	164.4
Beginning of the year balance of cash	9,815	11,261	(1,446)	(12.8)
End of the year balance of cash	\$10,746	\$ 9,815	\$ 931	9.5

The horizontal analysis of cash flows for Apple Inc. indicates an increase in cash flows from operating activities of 35.5%, which is a favorable trend. At the same time, Apple increased the cash used in its investing activities by 19.3% and decreased the cash it received from financing activities by 217.6%. Overall, Apple had a 164.4% increase in cash for the year, which increased the end-of-the-year cash balance by 9.5%. In contrast, in the prior year Apple decreased its ending cash balance, which is the beginning cash balance of the current year, by 12.8%.

Example Exercise 2-8 Horizontal Analysis

OBJ 5

Two income statements for McCorkle Company follow:

McCorkle Company Income Statements

For the	Years	Ended	December	3	1
---------	--------------	--------------	----------	---	---

	2016	2015
Fees earned	\$210,000	\$175,000
Operating expenses	172,500	150,000
Net income	\$ 37,500	\$ 25,000

Prepare a horizontal analysis of McCorkle Company's income statements.

Follow My Example 2-8

McCorkle Company Income Statements

For the Years Ended December 31

				Incre (Decr	
	2016	2015	Amount	Percent	
Fees earned	\$210,000	\$175,000	\$35,000	20%	
Operating expenses	172,500	150,000	22,500	15	
Net income	\$ 37,500	\$ 25,000	\$12,500	50	

Practice Exercises: PE 2-8A, PE 2-8B

At a Glance 2



Describe the characteristics of an account and a chart of accounts.

Key Points The simplest form of an account, a T account, has three parts: (1) a title, which is the name of the item recorded in the account; (2) a left side, called the debit side; and (3) a right side, called the credit side. Periodically, the debits in an account are added, the credits in the account are added, and the balance of the account is determined.

The system of accounts that make up a ledger is called a chart of accounts.

	Exercises
Record transactions in T accounts.	
Determine the balance of a T account.	
Prepare a chart of accounts for a corporation.	



Describe and illustrate journalizing transactions using the double-entry accounting system.

Key Points Transactions are initially entered in a record called a journal. The rules of debit and credit for recording increases or decreases in accounts are shown in Exhibit 3. Each transaction is recorded so that the sum of the debits is always equal to the sum of the credits. The normal balance of an account is indicated by the side of the account (debit or credit) that receives the increases.

Learning Outcomes	Example Exercises	Practice Exercises
• Indicate the normal balance of an account.	EE2-1	PE2-1A, 2-1B
• Journalize transactions using the rules of debit and credit.	EE2-2	PE2-2A, 2-2B



Describe and illustrate the journalizing and posting of transactions to accounts.

Key Points Transactions are journalized and posted to the ledger using the rules of debit and credit. The debits and credits for each journal entry are posted to the accounts in the order in which they occur in the journal.

Learning Outcomes • Journalize transactions using the rules of debit and credit.	Example Exercises EE2-3	Practice Exercises PE2-3A, 2-3B	
 Given other account data, determine the missing amount of an account entry. 	EE2-4	PE2-4A, 2-4B	
• Post journal entries to a standard account.	EE2-5	PE2-5A, 2-5B	
• Post journal entries to a T account.			



Prepare an unadjusted trial balance and explain how it can be used to discover errors.

Key Points A trial balance is prepared by listing the accounts from the ledger and their balances. The totals of the Debit column and Credit column of the trial balance must be equal. If the two totals are not equal, an error has occurred. Errors may occur even though the trial balance totals are equal. Such errors may require a correcting journal entry.

Learning Outcomes	Example Exercises	Practice Exercises
Prepare an unadjusted trial balance.	EE2-6	PE2-6A, 2-6B
• Discover errors that cause unequal totals in the trial balance.	EE2-7	PE2-7A, 2-7B
• Prepare correcting journal entries for various errors.		



Describe and illustrate the use of horizontal analysis in evaluating a company's performance and financial condition.

Key Points In horizontal analysis, the amount of each item on a current financial statement is compared with the same item on an earlier statement. The increase or decrease in the *amount* of the item is computed, together with the *percent* of increase or decrease. When two statements are being compared, the earlier statement is used as the base for computing the amount and the percent of change.

Learning Outcomes	Example Exercises	Practice Exercises
Describe horizontal analysis.		
• Prepare a horizontal analysis report of a financial statement.	EE2-8	PE2-8A, 2-8B

Key Terms

account (52)
account receivable (65)
assets (54)
balance of the account (53)
chart of accounts (54)
correcting journal entry (72)
common stock (54)
credit (53)
debit (53)
dividends (54)

double-entry accounting system (55) expenses (55) horizontal analysis (73) journal (57) journal entry (58) journalizing (58) ledger (54) liabilities (54) normal balance of an account (56) posting (61)

retained earnings (54) revenues (54) rules of debit and credit (55) slide (71) stockholders' equity (54) T account (52) transposition (71) trial balance (70) unadjusted trial balance (70) unearned revenue (63)

Illustrative Problem

J.F. Outz, M.D., organized Hearts Inc. three years ago to practice cardiology. During April 2015, Hearts Inc. completed the following transactions:

- Apr. 1. Paid office rent for April, \$800.
 - 3. Purchased equipment on account, \$2,100.
 - 5. Received cash on account from patients, \$3,150.
 - 8. Purchased X-ray film and other supplies on account, \$245.
 - 9. One of the items of equipment purchased on April 3 was defective. It was returned with the permission of the supplier, who agreed to reduce the account for the amount charged for the item, \$325.
 - 12. Paid cash to creditors on account, \$1,250.

- Apr. 17. Paid cash for renewal of a six-month property insurance policy, \$370.
 - 20. Discovered that the balances of the cash account and the accounts payable account as of April 1 were overstated by \$200. A payment of that amount to a creditor in March had not been recorded. Journalize the \$200 payment as of April 20.
 - 24. Paid cash for laboratory analysis, \$545.
 - 27. Paid dividends, \$1,250.
 - 30. Recorded the cash received in payment of services (on a cash basis) to patients during April, \$1,720.
 - 30. Paid salaries of receptionist and nurses, \$1,725.
 - 30. Paid various utility expenses, \$360.
 - 30. Recorded fees charged to patients on account for services performed in April, \$5,145.
 - 30. Paid miscellaneous expenses, \$132.

Hearts Inc.'s account titles, numbers, and balances as of April 1 (all normal balances) are listed as follows: Cash, 11, \$4,123; Accounts Receivable, 12, \$6,725; Supplies, 13, \$290; Prepaid Insurance, 14, \$465; Equipment, 18, \$19,745; Accounts Payable, 22, \$765; Common Stock, 31, \$10,000; Retained Earnings, 32, \$20,583; Dividends, 33, \$0; Professional Fees, 41, \$0; Salary Expense, 51, \$0; Rent Expense, 53, \$0; Laboratory Expense, 55, \$0; Utilities Expense, 56, \$0; Miscellaneous Expense, 59, \$0.

Instructions

- 1. Open a ledger of standard four-column accounts for Hearts Inc. as of April 1. Enter the balances in the appropriate balance columns and place a check mark (✓) in the Posting Reference column. (*Hint:* Verify the equality of the debit and credit balances in the ledger before proceeding with the next instruction.)
- 2. Journalize each transaction in a two-column journal.
- 3. Post the journal to the ledger, extending the month-end balances to the appropriate balance columns after each posting.
- 4. Prepare an unadjusted trial balance as of April 30.

Solution 1., 2., and 3.

	Journal Page						
Date	Description	Post. Ref.	Debit	Credit			
Apr. 1	Rent Expense Cash Paid office rent for April.	53 11	800	800			
3	Equipment Accounts Payable Purchased equipment on account.	18 22	2,100	2,100			
5	Cash Accounts Receivable Received cash on account.	11 12	3,150	3,150			
8	Supplies Accounts Payable Purchased supplies.	13 22	245	245			
9	Accounts Payable Equipment Returned defective equipment.	22 18	325	325			
12	Accounts Payable Cash Paid creditors on account.	22 11	1,250	1,250			
17	Prepaid Insurance Cash Renewed six-month property policy.	14 11	370	370			
20	Accounts Payable Cash Recorded March payment to creditor.	22 11	200	200			

	Journal Page 28						
Date	Description	Post. Ref.	Debit	Credit			
2015 Apr. 24	Laboratory Expense Cash Paid for laboratory analysis.	55 11	545	545			
27	Dividends Cash Paid dividends.	33 11	1,250	1,250			
30	Cash Professional Fees Received fees from patients.	11 41	1,720	1,720			
30	Salary Expense Cash Paid salaries.	51 11	1,725	1,725			
30	Utilities Expense Cash Paid utilities.	56 11	360	360			
30	Accounts Receivable Professional Fees Recorded fees earned on account.	12 41	5,145	5,145			
30	Miscellaneous Expense Cash Paid expenses.	59 11	132	132			

Accou	Account Cash Account No. 11						
					Bala	ance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015	D 1	,			4.400		
Apr. 1	Balance	✓			4,123		
1		27		800	3,323		
5		27	3,150		6,473		
12		27		1,250	5,223		
17		27		370	4,853		
20		27		200	4,653		
24		28		545	4,108		
27		28		1,250	2,858		
30		28	1,720		4,578		
30		28		1,725	2,853		
30		28		360	2,493		
30		28		132	2,361		

Account Accounts Receivable					Account	No. 12
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Apr. 1	Balance	✓			6,725	
5		27		3,150	3,575	
30		28	5,145		8,720	

Accou	ı nt Supplies	Account No. 13				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Apr. 1	Balance	√ 27	245		290 535	

Accou	I nt Prepaid Ir	Account No. 14				
					Bala	ance
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Apr. 1	Balance	✓			465	
17		27	370		835	

Accou	I nt Equipmei	Account No. 18				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Apr. 1	Balance	✓			19,745	
3		27	2,100		21,845	
9		27		325	21,520	

Accou	I nt Accounts	Account No. 22				
					Balance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Apr. 1	Balance	✓				765
3		27		2,100		2,865
8		27		245		3,110
9		27	325			2,785
12		27	1,250			1,535
20		27	200			1,335

Accou	nt Common	Account No. 31				
					Bala	ance
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit
2015 Apr. 1	Balance	✓				10,000

ı	Accou	I nt Retained	Account No. 32				
						Bala	ince
	Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
	²⁰¹⁵ Apr. 1	Balance	✓				20,583

Accou	I nt Dividend	Account No. 33				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Apr. 27		28	1,250		1,250	

Accou	I nt Professio	Account No. 41					
					Bala	ance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Apr. 30		28		1,720		1,720	
30		28		5,145		6,865	

Accou	ı nt Salary Ex	Account No. 51				
				Bala		nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Apr. 30		28	1,725		1,725	

Αςςοι	I nt Rent Expe	Account No. 53				
					Balance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015 Apr. 1		27	800		800	

Accou	ı nt Laborato	Account No. 55				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Apr. 24		28	545		545	

Accou	I nt Utilities E	Account No. 56				
					Balance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Apr. 30		28	360		360	

Account Miscellaneous Expense						Account No. 59		
					Balance			
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit		
²⁰¹⁵ Apr. 30		28	132		132			

J. F. Outz, M.D. Unadjusted Trial Balance April 30, 2015				
	Debit Balances	Credit Balances		
Cash	2,361			
Accounts Receivable	8,720			
Supplies	535			
Prepaid Insurance	835			
Equipment	21,520			
Accounts Payable		1,335		
Common Stock		10,000		
Retained Earnings		20,583		
Dividends	1,250			
Professional Fees		6,865		
Salary Expense	1,725			
Rent Expense	800			
Laboratory Expense	545			
Utilities Expense	360			
Miscellaneous Expense	132			
	38,783	38,783		

Discussion Questions

- What is the difference between an account and a ledger?
- 2. Do the terms *debit* and *credit* signify increase or decrease or can they signify either? Explain.
- 3. McIntyre Company adheres to a policy of depositing all cash receipts in a bank account and making all payments by check. The cash account as of December 31 has a credit balance of \$1,850, and there is no undeposited cash on hand. (a) Assuming no errors occurred during journalizing or posting, what caused this unusual balance? (b) Is the \$1,850 credit balance in the cash account an asset, a liability, stockholders' equity, a revenue, or an expense?
- eCatalog Services Company performed services in October for a specific customer, for a fee of \$7,890.
 Payment was received the following November.
 (a) Was the revenue earned in October or November?
 (b) What accounts should be debited and credited in (1) October and (2) November?
- 5. If the two totals of a trial balance are equal, does it mean that there are no errors in the accounting records? Explain.
- 6. Assume that a trial balance is prepared with an account balance of \$8,900 listed as \$9,800 and an account balance of \$1,000 listed as \$100. Identify the transposition and the slide.

- 7. Assume that when a purchase of supplies of \$2,650 for cash was recorded, both the debit and the credit were journalized and posted as \$2,560. (a) Would this error cause the trial balance to be out of balance? (b) Would the trial balance be out of balance if the \$2,650 entry had been journalized correctly but the credit to Cash had been posted as \$2,560?
- 8. Assume that Muscular Consulting erroneously recorded the payment of \$7,500 of dividends as a debit to Salary Expense. (a) How would this error affect the equality of the trial balance? (b) How would this error affect the income statement, retained earnings statement, and balance sheet?
- 9. Assume that Sunshine Realty Co. borrowed \$300,000 from Columbia First Bank and Trust. In recording the transaction, Sunshine erroneously recorded the receipt as a debit to Cash, \$300,000, and a credit to Fees Earned, \$300,000. (a) How would this error affect the equality of the trial balance? (b) How would this error affect the income statement, retained earnings statement, and balance sheet?
- 10. Checking accounts are one of the most common forms of deposits for banks. Assume that Surety Storage has a checking account at Ada Savings Bank. What type of account (asset, liability, stockholders' equity, revenue, expense, dividends) does the account balance of \$11,375 represent from the viewpoint of (a) Surety Storage and (b) Ada Savings Bank?

Practice Exercises

EE 2-1 p. 57

PE 2-1A Rules of debit and credit and normal balances

OBJ. 2

State for each account whether it is likely to have (a) debit entries only, (b) credit entries only, or (c) both debit and credit entries. Also, indicate its normal balance.

1. Accounts Receivable

4. Common Stock

2. Commissions Earned

5. Rent Revenue

3. Notes Payable

6. Wages Expense

PE 2-1B Rules of debit and credit and normal balances

OBJ. 2

State for each account whether it is likely to have (a) debit entries only, (b) credit entries only, or (c) both debit and credit entries. Also, indicate its normal balance.

1. Accounts Payable

4. Miscellaneous Expense

2. Cash

5. Insurance Expense

3. Dividends

6. Fees Earned



ME HOW

PE 2-2A Journal entry for asset purchase **EE 2-2** p. 61

OBJ. 2

Prepare a journal entry for the purchase of office equipment on October 27 for \$32,750, paying \$6,550 cash and the remainder on account.



PE 2-2B Journal entry for asset purchase **EE 2-2** p. 61

Prepare a journal entry for the purchase of office supplies on September 30 for \$2,500, paying \$800 cash and the remainder on account.



PE 2-3A Journal entry for fees earned **EE 2-3** p. 65

OBJ. 3

Prepare a journal entry on March 16 for fees earned on account, \$9,450.



PE 2-3B Journal entry for fees earned **EE 2-3** p. 65

OBJ. 3

Prepare a journal entry on August 13 for cash received for services rendered, \$9,000.



PE 2-4A Journal entry for dividends **EE 2-4** p. 68

OBJ. 3

Prepare a journal entry on December 23 for dividends of \$20,000.



EE 2-4 *p. 68*

PE 2-4B Journal entry for dividends

OBJ. 3

Prepare a journal entry on June 30 for dividends of \$11,500.

EE 2-5 p. 68 PE 2-5A Missing amount from an account

OBJ. 3



On July 1, the cash account balance was \$37,450. During July, cash payments totaled \$115,860 and the July 31 balance was \$29,600. Determine the cash receipts during July.

EE 2-5 p. 68 PE 2-5B Missing amount from an account

OBJ. 3



On August 1, the supplies account balance was \$1,025. During August, supplies of \$3,110 were purchased, and \$1,324 of supplies were on hand as of August 31. Determine supplies expense for August.

EE 2-6 p. 72 PE 2-6A Trial balance errors

ORI 4



For each of the following errors, considered individually, indicate whether the error would cause the trial balance totals to be unequal. If the error would cause the trial balance totals to be unequal, indicate whether the debit or credit total is higher and by how much.

- a. The payment of an insurance premium of \$5,400 for a three-year policy was debited to Prepaid Insurance for \$5,400 and credited to Cash for \$4,500.
- b. A payment of \$270 on account was debited to Accounts Payable for \$720 and credited to Cash for \$720.
- c. A purchase of supplies on account for \$1,600 was debited to Supplies for \$1,600 and debited to Accounts Payable for \$1,600.

EE 2-6 p. 72 PE 2-6B Trial balance errors

OBJ. 4



For each of the following errors, considered individually, indicate whether the error would cause the trial balance totals to be unequal. If the error would cause the trial balance totals to be unequal, indicate whether the debit or credit total is higher and by how much.

- a. The payment of cash for the purchase of office equipment of \$12,900 was debited to Land for \$12,900 and credited to Cash for \$12,900.
- b. The payment of \$1,840 on account was debited to Accounts Payable for \$184 and credited to Cash for \$1,840.
- c. The receipt of cash on account of \$3,800 was recorded as a debit to Cash for \$8,300 and a credit to Accounts Receivable for \$3,800.

EE 2-7 p. 73 PE 2-7A Correcting entries

OBJ. 4



The following errors took place in journalizing and posting transactions:

- a. Rent expense of \$4,650 paid for the current month was recorded as a debit to Miscellaneous Expense and a credit to Rent Expense.
- b. The payment of \$3,700 from a customer on account was recorded as a debit to Cash and a credit to Accounts Payable.

Journalize the entries to correct the errors. Omit explanations.

EE 2-7 p. 73 PE 2-7B Correcting entries

OBJ. 4



The following errors took place in journalizing and posting transactions:

- a. The receipt of \$8,400 for services rendered was recorded as a debit to Accounts Receivable and a credit to Fees Earned.
- b. The purchase of supplies of \$2,500 on account was recorded as a debit to Office Equipment and a credit to Supplies.

Journalize the entries to correct the errors. Omit explanations.



EE 2-8 p. 75 PE 2-8A Horizontal analysis

OBJ. 5

Two income statements for Fuller Company follow:

(Continued)



Fuller Company Income Statements For Years Ended December 31

	2016	2015
Fees earned	\$680,000	\$850,000
Operating expenses	541,875	637,500
Net income	\$138,125	\$212,500

Prepare a horizontal analysis of Fuller Company's income statements.

EE 2-8 p. 75

PE 2-8B Horizontal analysis

OBJ. 5





Two income statements for Paragon Company follow:

Paragon Company Income Statements For Years Ended December 31

	2016	2015
Fees earned	\$1,416,000	\$1,200,000
Operating expenses	1,044,000	900,000
Net income	\$ 372,000	\$ 300,000

Prepare a horizontal analysis of Paragon Company's income statements.

Exercises



EX 2-1 Chart of accounts

OBJ. 1

The following accounts appeared in recent financial statements of Delta Air Lines:

Accounts Payable Flight Equipment

Advanced Payments for Equipment Frequent Flyer (Obligations)

Air Traffic Liability Fuel Inventory

Aircraft Fuel (Expense)

Aircraft Maintenance (Expense)

Aircraft Rent (Expense)

Aircraft Rent (Expense)

Landing Fees (Expense)

Parts and Supplies Inventories

Passenger Commissions (Expense)

Cargo Revenue Passenger Revenue
Cash Prepaid Expenses
Contract Carrier Arrangements (Expense) Taxes Payable

Identify each account as either a balance sheet account or an income statement account. For each balance sheet account, identify it as an asset, a liability, or stockholders' equity. For each income statement account, identify it as a revenue or an expense.

EX 2-2 Chart of accounts

OBJ. 1

Innerscape Interiors is owned and operated by Jackie Vargo, an interior decorator. In the ledger of Innerscape Interiors, the first digit of the account number indicates its major account classification (1—assets, 2—liabilities, 3—stockholders' equity, 4—revenues, 5—expenses). The second digit of the account number indicates the specific account within each of the preceding major account classifications.

Match each account number with its most likely account in the list that follows. The account numbers are 11, 12, 13, 21, 31, 32, 33, 41, 51, 52, and 53.

Accounts Payable Land

Accounts Receivable Miscellaneous Expense
Cash Retained Earnings
Common Stock Supplies Expense
Dividends Wages Expense

Fees Earned

EX 2-3 Chart of accounts

OBJ, 1

LeadCo School is a newly organized business that teaches people how to inspire and influence others. The list of accounts to be opened in the general ledger is as follows:

Accounts Payable	Prepaid Insurance
Accounts Receivable	Rent Expense
Cash	Retained Earnings
Common Stock	Supplies
Dividends	Supplies Expense
Equipment	Unearned Rent
Fees Earned	Wages Expense
Miscellaneous Expense	

List the accounts in the order in which they should appear in the ledger of LeadCo School and assign account numbers. Each account number is to have two digits: the first digit is to indicate the major classification (1 for assets, etc.), and the second digit is to identify the specific account within each major classification (11 for Cash, etc.).

EX 2-4 Rules of debit and credit

OBJ. 1, 2

The following table summarizes the rules of debit and credit. For each of the items (a) through (l), indicate whether the proper answer is a debit or a credit.

	Increase	Decrease	Normal Balance
Balance sheet accounts:			
Asset	(a)	(b)	Debit
Liability	(c)	Debit	(d)
Stockholders' equity:			
Common Stock	Credit	(e)	(f)
Retained Earnings	(g)	(h)	Credit
Dividends	Debit	Credit	(i)
Income statement accounts:			
Revenue	(j)	(k)	Credit
Expense	(1)	Credit	Debit

EX 2-5 Normal entries for accounts

OBJ. 2

During the month, Gates Labs Co. has a substantial number of transactions affecting each of the following accounts. State for each account whether it is likely to have (a) debit entries only, (b) credit entries only, or (c) both debit and credit entries.

- 1. Accounts Payable
- 2. Accounts Receivable
- 3. Cash
- 4. Fees Earned

- 5. Insurance Expense
- 6. Dividends
- 7. Utilities Expense

EX 2-6 Normal balances of accounts

OBJ. 1, 2

Identify each of the following accounts of Kaiser Services Co. as asset, liability, stockholders' equity, revenue, or expense, and state in each case whether the normal balance is a debit or a credit:

- a. Accounts Payable
- b. Accounts Receivable
- c. Cash
- d. Common Stock
- e. Dividends

- f. Fees Earned
- g. Office Equipment
- h. Rent Expense
- i. Supplies
- j. Wages Expense

EX 2-7 Transactions

OBJ. 2

Jardine Consulting Co. has the following accounts in its ledger: Cash, Accounts Receivable, Supplies, Office Equipment, Accounts Payable, Common Stock, Retained Earnings, Dividends, Fees Earned, Rent Expense, Advertising Expense, Utilities Expense, Miscellaneous Expense.

Journalize the following selected transactions for March 2016 in a two-column journal.

Journal entry explanations may be omitted.

(Continued)



- Mar. 1. Paid rent for the month, \$2,500.
 - 3. Paid advertising expense, \$675.
 - 5. Paid cash for supplies, \$1,250.
 - 6. Purchased office equipment on account, \$9,500.
 - 10. Received cash from customers on account, \$16,550.
 - 15. Paid creditor on account, \$3,180.
 - 27. Paid cash for repairs to office equipment, \$540.
 - 30. Paid telephone bill for the month, \$375.
 - 31. Fees earned and billed to customers for the month, \$49,770.
 - 31. Paid electricity bill for the month, \$830.
 - 31. Paid dividends, \$1,750.

EX 2-8 Journalizing and posting

OBJ. 2, 3

On January 7, 2016, Captec Company purchased \$4,175 of supplies on account. In Captec Company's chart of accounts, the supplies account is No. 15, and the accounts payable account is No. 21.

- a. Journalize the January 7, 2016, transaction on page 33 of Captec Company's two-column journal. Include an explanation of the entry.
- b. Prepare a four-column account for Supplies. Enter a debit balance of \$2,200 as of January 1, 2016. Place a check mark (✓) in the Posting Reference column.
- c. Prepare a four-column account for Accounts Payable. Enter a credit balance of \$18,430 as of January 1, 2016. Place a check mark (✓) in the Posting Reference column.
- d. Post the January 7, 2016, transaction to the accounts.
- e. Do the rules of debit and credit apply to all companies?

EX 2-9 Transactions and T accounts

OBJ. 2. 3

The following selected transactions were completed during August of the current year:

- 1. Billed customers for fees earned, \$73,900.
- 2. Purchased supplies on account, \$1,960.
- 3. Received cash from customers on account, \$62,770.
- 4. Paid creditors on account, \$820.
- a. Journalize these transactions in a two-column journal, using the appropriate number to identify the transactions. Journal entry explanations may be omitted.
- b. Post the entries prepared in (a) to the following T accounts: Cash, Supplies, Accounts Receivable, Accounts Payable, Fees Earned. To the left of each amount posted in the accounts, place the appropriate number to identify the transactions.
- c. Assume that the unadjusted trial balance on August 31 shows a credit balance for Accounts Receivable. Does this credit balance mean an error has occurred?

EX 2-10 Cash account balance

OBJ. 1, 2, 3

During the month, Warwick Co. received \$515,000 in cash and paid out \$375,000 in cash.

- a. Do the data indicate that Warwick Co. had net income of \$140,000 during the month? Explain.
- b. If the balance of the cash account is \$200,000 at the end of the month, what was the cash balance at the beginning of the month?

EX 2-11 Account balances

OBJ. 1, 2, 3

- a. During February, \$186,500 was paid to creditors on account, and purchases on account were \$201,400. Assuming the February 28 balance of Accounts Payable was \$59,900, determine the account balance on February 1.
- b. On October 1, the accounts receivable account balance was \$115,800. During October, \$449,600 was collected from customers on account. Assuming the October 31 balance was \$130,770 determine the fees billed to customers on account during October.







√ c. \$238,050



c. On April 1, the cash account balance was \$46,220. During April, cash receipts totaled \$248,600 and the April 30 balance was \$56,770. Determine the cash payments made during April.

EX 2-12 Retained earnings account balance

OBJ, 1, 2

As of January 1, Retained Earnings had a credit balance of \$314,000. During the year, dividends totaled \$10,000, and the business incurred a net loss of \$320,000.

- a. Compute the balance of Retained Earnings as of the end of the year.
- b. Assuming that there have been no recording errors, will the balance sheet prepared at December 31 balance? Explain.

EX 2-13 Identifying transactions

OBJ. 1, 2

Wyoming Tours Co. is a travel agency. The nine transactions recorded by Wyoming Tours during June 2016, its first month of operations, are indicated in the following T accounts:

Cash			Equipment			Dividends			
(1)	40,000	(2)	2,500	(3)	14,500		(9)	3,000	
(7)	8,700	(3)	4,000						
		(4)	4,850						
		(6)	5,500						
		(9)	3,000						

Accounts Receivable				Accounts Payable Service Revenue			2				
(5)	13,800	(7)	8,700	(6)	5,500	(3)	10,500			(5)	13,800
	Sup	plies			Commo	n Stock	:		Operating	j Expens	es
(2)	2,500	(8)	1,100			(1)	40,000	(4)	4,850		
								(8)	1,100		

Indicate for each debit and each credit: (a) whether an asset, liability, stockholders' equity, dividend, revenue, or expense account was affected and (b) whether the account was increased (+) or decreased (-). Present your answers in the following form, with transaction (1) given as an example:

	Account	Debited	Account Credited	t Debited Account Credit	
Transaction	Type	Effect	Type Effect	Effect Type	ffect
(1)	asset	+	stockholders' equity +	+ stockholders' equity	+

EX 2-14 Journal entries

OBJ. 1, 2

Based upon the T accounts in Exercise 2-13, prepare the nine journal entries from which the postings were made. Journal entry explanations may be omitted.

EX 2-15 Trial balance

OBJ. 4

Based upon the data presented in Exercise 2-13, (a) prepare an unadjusted trial balance, listing the accounts in their proper order. (b) Based upon the unadjusted trial balance, determine the net income or net loss.

EX 2-16 Trial balance

OBJ. 4

The accounts in the ledger of Hickory Furniture Company as of December 31, 2016, are listed in alphabetical order as follows. All accounts have normal balances. The balance of the cash account has been intentionally omitted.

(Continued)







✓ (a) Total of Debit column: \$58,800





✓ Total of Credit column: \$925,000



Accounts Payable	\$ 42,770	Notes Payable	\$ 50,000
Accounts Receivable	116,900	Prepaid Insurance	21,600
Cash	?	Rent Expense	48,000
Common Stock	15,000	Retained Earnings	60,000
Dividends	24,000	Supplies	4,275
Fees Earned	745,230	Supplies Expense	6,255
Insurance Expense	3,600	Unearned Rent	12,000
Land	50,000	Utilities Expense	26,850
Miscellaneous Expense	9,500	Wages Expense	580,700

Prepare an unadjusted trial balance, listing the accounts in their normal order and inserting the missing figure for cash.

EX 2-17 Effect of errors on trial balance

OBJ. 4

Indicate which of the following errors, each considered individually, would cause the trial balance totals to be unequal:

- a. A fee of \$21,000 earned and due from a client was not debited to Accounts Receivable or credited to a revenue account, because the cash had not been received.
- b. A receipt of \$11,300 from an account receivable was journalized and posted as a debit of \$11,300 to Cash and a credit of \$11,300 to Fees Earned.
- c. A payment of \$4,950 to a creditor was posted as a debit of \$4,950 to Accounts Payable and a debit of \$4,950 to Cash.
- d. A payment of \$5,000 for equipment purchased was posted as a debit of \$500 to Equipment and a credit of \$500 to Cash.
- e. Payment of a cash dividends of \$19,000 was journalized and posted as a debit of \$1,900 to Salary Expense and a credit of \$19,000 to Cash.

Indicate which of the preceding errors would require a correcting entry.

EX 2-18 Errors in trial balance

OBJ. 4

✓ Total of Credit column: \$525,000

The following preliminary unadjusted trial balance of Ranger Co., a sports ticket agency, does not balance:

Ranger Co. Unadjusted Trial Balance August 31, 2016

	Debit Balances	Credit Balances
Cash	77,600	
Accounts Receivable	37,750	
Prepaid Insurance		12,000
Equipment	19,000	
Accounts Payable		29,100
Unearned Rent		10,800
Common Stock	40,000	
Retained Earnings	70,000	
Dividends	13,000	
Service Revenue		385,000
Wages Expense		213,000
Advertising Expense	16,350	
Miscellaneous Expense		18,400
	273,700	668,300

When the ledger and other records are reviewed, you discover the following: (1) the debits and credits in the cash account total \$77,600 and \$62,100, respectively; (2) a billing of \$9,000 to a customer on account was not posted to the accounts receivable account; (3) a payment of \$4,500 made to a creditor on account was not posted to the accounts payable account; (4) the balance of the unearned rent account is \$5,400; (5) the correct balance of the equipment account is \$190,000; and (6) each account has a normal balance.

Prepare a corrected unadjusted trial balance.

EX 2-19 Effect of errors on trial balance

OBJ. 4

The following errors occurred in posting from a two-column journal:

- 1. A credit of \$6,000 to Accounts Payable was not posted.
- 2. An entry debiting Accounts Receivable and crediting Fees Earned for \$5,300 was not posted.
- 3. A debit of \$2,700 to Accounts Payable was posted as a credit.
- 4. A debit of \$480 to Supplies was posted twice.
- 5. A debit of \$3,600 to Cash was posted to Miscellaneous Expense.
- 6. A credit of \$780 to Cash was posted as \$870.
- 7. A debit of \$12,620 to Wages Expense was posted as \$12,260.

Considering each case individually (i.e., assuming that no other errors had occurred), indicate: (a) by "yes" or "no" whether the trial balance would be out of balance; (b) if answer to (a) is "yes," the amount by which the trial balance totals would differ; and (c) whether the Debit or Credit column of the trial balance would have the larger total. Answers should be presented in the following form, with error (1) given as an example:

	(a)	(b)	(c)
Error	Out of Balance	Difference	Larger Total
1.	yes	\$6,000	debit

EX 2-20 Errors in trial balance

OBJ. 4

Identify the errors in the following trial balance. All accounts have normal balances.

Mascot Co. Unadjusted Trial Balance For the Month Ending July 31, 2016

	Debit Balances	Credit Balances
Cash	36,000	
Accounts Receivable		112,600
Prepaid Insurance	18,000	
Equipment	375,000	
Accounts Payable	53,300	
Salaries Payable		7,500
Common Stock		100,000
Retained Earnings		197,200
Dividends		17,000
Service Revenue		682,000
Salary Expense	396,800	
Advertising Expense		73,000
Miscellaneous Expense	11,600	
	1,189,300	1,189,300

EX 2-21 Entries to correct errors

OBJ. 4

The following errors took place in journalizing and posting transactions:

- a. Insurance of \$18,000 paid for the current year was recorded as a debit to Insurance Expense and a credit to Prepaid Insurance.
- b. Dividends of \$10,000 were recorded as a debit to Wages Expense and a credit to Cash. Journalize the entries to correct the errors. Omit explanations.

EX 2-22 Entries to correct errors

OBJ. 4

The following errors took place in journalizing and posting transactions:

- a. Cash of \$8,800 received on account was recorded as a debit to Fees Earned and a credit to Cash.
- b. A \$1,760 purchase of supplies for cash was recorded as a debit to Supplies Expense and a credit to Accounts Payable.

Journalize the entries to correct the errors. Omit explanations.

✓ Total of Credit column: \$1,040,000











EX 2-23 Horizontal analysis of income statement

OBJ. 5

The following data (in millions) are taken from the financial statements of Target Corporation:

	Recent Year	Prior Year
Revenue	\$69,865	\$67,390
Operating expenses	64,543	62,138
Operating income	\$ 5,322	\$ 5,252

- a. For Target Corporation, determine the amount of change in millions and the percent of change (round to one decimal place) from the prior year to the recent year for:
 - 1. Revenue
 - 2. Operating expenses
 - 3. Operating income
- b. What conclusions can you draw from your analysis of the revenue and the total operating expenses?





EX 2-24 Horizontal analysis of income statement

OBJ. 5

The following data (in millions) were taken from the financial statements of Walmart Stores,

	Recent Year	Prior Year
Revenue	\$446,950	\$421,849
Operating expenses	420,392	396,307
Operating income	\$ 26,558	\$ 25,542

- a. For Walmart Stores, Inc., determine the amount of change in millions and the percent of change (round to one decimal place) from the prior year to the recent year for:
 - 1. Revenue
 - 2. Operating expenses
 - 3. Operating income
- b. Comment on the results of your horizontal analysis in part (a).
- c. Based upon Exercise 2-23, compare and comment on the operating results of Target and Walmart for the recent year.

Problems: Series A

PR 2-1A Entries into T accounts and trial balance

OBJ. 1, 2, 3, 4

✓ 3. Total of Debit column: \$80,650

Kimberly Manis, an architect, organized Manis Architects on January 1, 2016. During the month, Manis Architects completed the following transactions:

- a. Issued common stock to Kimberly Manis in exchange for \$18,000.
- b. Paid January rent for office and workroom, \$1,950.
- c. Purchased used automobile for \$28,500, paying \$5,700 cash and giving a note payable for the remainder.
- d. Purchased office and computer equipment on account, \$4,500.
- e. Paid cash for supplies, \$1,875.
- f. Paid cash for annual insurance policies, \$3,600.
- g. Received cash from client for plans delivered, \$13,650.
- h. Paid cash for miscellaneous expenses, \$2,600.
- i. Paid cash to creditors on account, \$3,000.
- j. Paid installment due on note payable, \$950.
- k. Received invoice for blueprint service, due in February, \$3,750.
- l. Recorded fees earned on plans delivered, payment to be received in February, \$21,900.
- m. Paid salary of assistants, \$4,100.
- n. Paid gas, oil, and repairs on automobile for January, \$1,300.

Instructions

- 1. Record these transactions directly in the following T accounts, without journalizing: Cash, Accounts Receivable, Supplies, Prepaid Insurance, Automobiles, Equipment, Notes Payable, Accounts Payable, Common Stock, Professional Fees, Salary Expense, Blueprint Expense, Rent Expense, Automobile Expense, Miscellaneous Expense. To the left of the amount entered in the accounts, place the appropriate letter to identify the transaction.
- 2. Determine account balances of the T accounts. Accounts containing a single entry only (such as Prepaid Insurance) do not need a balance.
- 3. Prepare an unadjusted trial balance for Manis Architects as of January 31, 2016.
- 4. Determine the net income or net loss for January.

PR 2-2A Journal entries and trial balance

OBJ. 1, 2, 3, 4

On August 1, 2016, Bill Hudson established Heritage Realty, which completed the following transactions during the month:

- a. Bill Hudson transferred cash from a personal bank account to an account to be used for the business in exchange for common stock, \$30,000.
- b. Paid rent on office and equipment for the month, \$3,250.
- c. Purchased supplies on account, \$2,150.
- d. Paid creditor on account, \$875.
- e. Earned sales commissions, receiving cash, \$14,440.
- f. Paid automobile expenses (including rental charge) for month, \$1,580, and miscellaneous expenses, \$650.
- g. Paid office salaries, \$3,000.
- h. Determined that the cost of supplies used was \$1,300.
- i. Paid dividends, \$2,500.

Instructions

- 1. Journalize entries for transactions (a) through (i), using the following account titles: Cash, Supplies, Accounts Payable, Common Stock, Dividends, Sales Commissions, Rent Expense, Office Salaries Expense, Automobile Expense, Supplies Expense, Miscellaneous Expense. Explanations may be omitted.
- 2. Prepare T accounts, using the account titles in (1). Post the journal entries to these accounts, placing the appropriate letter to the left of each amount to identify the transactions. Determine the account balances, after all posting is complete. Accounts containing only a single entry do not need a balance.
- 3. Prepare an unadjusted trial balance as of August 31, 2016.
- 4. Determine the following:
 - a. Amount of total revenue recorded in the ledger.
 - b. Amount of total expenses recorded in the ledger.
 - c. Amount of net income for August.
- 5. Determine the increase or decrease in retained earnings for August.

PR 2-3A Journal entries and trial balance

OBJ. 1, 2, 3, 4

On November 1, 2016, Patty Cosgrove established an interior decorating business, Classic Designs. During the month, Patty completed the following transactions related to the business:

- Nov. 1. Patty transferred cash from a personal bank account to an account to be used for the business in exchange for common stock, \$27,750.
 - 1. Paid rent for period of November 1 to end of month, \$4,000.
 - 6. Purchased office equipment on account, \$12,880.
 - 8. Purchased a truck for \$32,500 paying \$6,500 cash and giving a note payable for the remainder.
 - 10. Purchased supplies for cash, \$1,860.
 - 12. Received cash for job completed, \$7,500.

(Continued)

✓ 4. c. \$4,660



General Ledger



✓ 3. Total of Credit column: \$81,450



General Ledger



- Nov. 15. Paid annual premiums on property and casualty insurance, \$2,400.
 - 23. Recorded jobs completed on account and sent invoices to customers, \$12,440.
 - 24. Received an invoice for truck expenses, to be paid in November, \$1,100.

Enter the following transactions on Page 2 of the two-column journal:

- 29. Paid utilities expense, \$3,660.
- 29. Paid miscellaneous expenses, \$1,700.
- 30. Received cash from customers on account, \$8,000.
- 30. Paid wages of employees, \$4,750.
- 30. Paid creditor a portion of the amount owed for equipment purchased on November 6, \$6,220.
- 30. Paid dividends, \$2,000.

Instructions

1. Journalize each transaction in a two-column journal beginning on Page 1, referring to the following chart of accounts in selecting the accounts to be debited and credited. (Do not insert the account numbers in the journal at this time.) Explanations may be omitted.

11	Cash	31	Common Stock
12	Accounts Receivable	33	Dividends
13	Supplies	41	Fees Earned
14	Prepaid Insurance	51	Wages Expense
16	Equipment	53	Rent Expense
18	Truck	54	Utilities Expense
21	Notes Payable	55	Truck Expense
22	Accounts Payable	59	Miscellaneous Expense

- 2. Post the journal to a ledger of four-column accounts, inserting appropriate posting references as each item is posted. Extend the balances to the appropriate balance columns after each transaction is posted.
- 3. Prepare an unadjusted trial balance for Classic Designs as of November 30, 2016.
- 4. Determine the excess of revenues over expenses for November.
- 5. Can you think of any reason why the amount determined in (4) might not be the net income for November?

PR 2-4A Journal entries and trial balance

OBJ. 1, 2, 3, 4

Cradit

Debit

Elite Realty acts as an agent in buying, selling, renting, and managing real estate. The unadjusted trial balance on March 31, 2016, follows:

Elite Realty Unadjusted Trial Balance March 31, 2016

		Balances	Balances
11	Cash	26,300	
12	Accounts Receivable	61,500	
13	Prepaid Insurance	3,000	
14	Office Supplies	1,800	
16	Land	_	
21	Accounts Payable		14,000
22	Unearned Rent		_
23	Notes Payable		_
31	Common Stock		10,000
32	Retained Earnings		36,000
33	Dividends	2,000	
41	Fees Earned		240,000
51	Salary and Commission Expense	148,200	
52	Rent Expense	30,000	
53	Advertising Expense	17,800	
54	Automobile Expense	5,500	
59	Miscellaneous Expense	3,900	
		300,000	300,000

✓ 4. Total of Debit column: \$532,525

General Ledger

The following business transactions were completed by Elite Realty during April 2016:

- Apr. 1. Paid rent on office for month, \$6,500.
 - 2. Purchased office supplies on account, \$2,300.
 - 5. Paid insurance premiums, \$6,000.
 - 10. Received cash from clients on account, \$52,300.
 - 15. Purchased land for a future building site for \$200,000, paying \$30,000 in cash and giving a note payable for the remainder.
 - 17. Paid creditors on account, \$6,450.
 - 20. Returned a portion of the office supplies purchased on April 2, receiving full credit for their cost, \$325.
 - 23. Paid advertising expense, \$4,300.

Enter the following transactions on Page 19 of the two-column journal:

- 27. Discovered an error in computing a commission; received cash from the salesperson for the overpayment, \$2,500.
- 28. Paid automobile expense (including rental charges for an automobile), \$1,500.
- 29. Paid miscellaneous expenses, \$1,400.
- 30. Recorded revenue earned and billed to clients during the month, \$57,000.
- 30. Paid salaries and commissions for the month, \$11,900.
- 30. Paid dividends, \$4,000.
- 30. Rented land purchased on April 15 to local merchants association for use as a parking lot in May and June, during a street rebuilding program; received advance payment of \$10,000.

Instructions

- 1. Record the April 1, 2016, balance of each account in the appropriate balance column of a four-column account, write *Balance* in the item section, and place a check mark (✓) in the Posting Reference column.
- 2. Journalize the transactions for April in a two-column journal beginning on Page 18. Journal entry explanations may be omitted.
- 3. Post to the ledger, extending the account balance to the appropriate balance column after each posting.
- 4. Prepare an unadjusted trial balance of the ledger as of April 30, 2016.
- 5. Assume that the April 30 transaction for salaries and commissions should have been \$19,100. (a) Why did the unadjusted trial balance in (4) balance? (b) Journalize the correcting entry. (c) Is this error a transposition or slide?

PR 2-5A Corrected trial balance

OBJ. 4

The Colby Group has the following unadjusted trial balance as of August 31, 2016:

The Colby Group Unadjusted Trial Balance August 31, 2016

	Debit Balances	Credit Balances
Cash	17,300	
Accounts Receivable	37,000	
Supplies	7,400	
Prepaid Insurance	1,900	
Equipment	196,000	
Notes Payable		97,600
Accounts Payable		26,000
Common Stock		35,000
Retained Earnings		94,150
Dividends	56,000	
Fees Earned		454,450
Wages Expense	270,000	
Rent Expense	51,800	
Advertising Expense	25,200	
Miscellaneous Expense	5,100	
	667,700	707,200
	(Cantinual

(Continued)

✓ 1. Total of Debit column: \$725,000

The debit and credit totals are not equal as a result of the following errors:

- a. The cash entered on the trial balance was understated by \$6,000.
- b. A cash receipt of \$5,600 was posted as a debit to Cash of \$6,500.
- c. A debit of \$11,000 to Accounts Receivable was not posted.
- d. A return of \$150 of defective supplies was erroneously posted as a \$1,500 credit to Supplies.
- e. An insurance policy acquired at a cost of \$1,200 was posted as a credit to Prepaid Insurance.
- f. The balance of Notes Payable was understated by \$20,000.
- g. A credit of \$4,800 in Accounts Payable was overlooked when determining the balance of the account.
- h. A debit of \$7,000 for dividends was posted as a credit to Retained Earnings.
- i. The balance of \$58,100 in Rent Expense was entered as \$51,800 in the trial balance.
- Gas, Electricity, and Water Expense, with a balance of \$24,150, was omitted from the trial balance.

Instructions

- 1. Prepare a corrected unadjusted trial balance as of August 31, 2016.
- 2. Does the fact that the unadjusted trial balance in (1) is balanced mean that there are no errors in the accounts? Explain.

Problems: Series B

PR 2-1B Entries into T accounts and trial balance

OBJ, 1, 2, 3, 4

✓ 3. Total of Debit column: \$69,550

Ken Jones, an architect, organized Jones Architects on April 1, 2016. During the month, Jones Architects completed the following transactions:

- a. Transferred cash from a personal bank account to an account to be used for the business in exchange for common stock, \$18,000.
- b. Purchased used automobile for \$19,500, paying \$2,500 cash and giving a note payable for the remainder.
- c. Paid April rent for office and workroom, \$3,150.
- d. Paid cash for supplies, \$1,450.
- e. Purchased office and computer equipment on account, \$6,500.
- f. Paid cash for annual insurance policies on automobile and equipment, \$2,400.
- g. Received cash from a client for plans delivered, \$12,000.
- h. Paid cash to creditors on account, \$1,800.
- i. Paid cash for miscellaneous expenses, \$375.
- Received invoice for blueprint service, due in May, \$2,500.
- k. Recorded fees earned on plans delivered, payment to be received in May, \$15,650.
- 1. Paid salary of assistant, \$2,800.
- m. Paid cash for miscellaneous expenses, \$200.
- n. Paid installment due on note payable, \$300.
- o. Paid gas, oil, and repairs on automobile for April, \$550.

Instructions

- 1. Record these transactions directly in the following T accounts, without journalizing: Cash, Accounts Receivable, Supplies, Prepaid Insurance, Automobiles, Equipment, Notes Payable, Accounts Payable, Common Stock, Professional Fees, Rent Expense, Salary Expense, Blueprint Expense, Automobile Expense, Miscellaneous Expense. To the left of each amount entered in the accounts, place the appropriate letter to identify the transaction.
- (such as Prepaid Insurance) do not need a balance.

- 3. Prepare an unadjusted trial balance for Jones Architects as of April 30, 2016.
- 4. Determine the net income or net loss for April.

PR 2-2B Journal entries and trial balance

OBJ. 1, 2, 3, 4

On August 1, 2016, Rafael Masey established Planet Realty, which completed the following transactions during the month:

- a. Rafael Masey transferred cash from a personal bank account to an account to be used for the business in exchange for common stock, \$17,500.
- b. Purchased supplies on account, \$2,300.
- c. Earned sales commissions, receiving cash, \$13,300.
- d. Paid rent on office and equipment for the month, \$3,000.
- e. Paid creditor on account, \$1,150.
- f. Paid dividends, \$1,800.
- g. Paid automobile expenses (including rental charge) for month, \$1,500, and miscellaneous expenses, \$400.
- h. Paid office salaries, \$2,800.
- i. Determined that the cost of supplies used was \$1,050.

Instructions

- 1. Journalize entries for transactions (a) through (i), using the following account titles: Cash, Supplies, Accounts Payable, Common Stock, Dividends, Sales Commissions, Rent Expense, Office Salaries Expense, Automobile Expense, Supplies Expense, Miscellaneous Expense. Journal entry explanations may be omitted.
- 2. Prepare T accounts, using the account titles in (1). Post the journal entries to these accounts, placing the appropriate letter to the left of each amount to identify the transactions. Determine the account balances, after all posting is complete. Accounts containing only a single entry do not need a balance.
- 3. Prepare an unadjusted trial balance as of August 31, 2016.
- 4. Determine the following:
 - a. Amount of total revenue recorded in the ledger.
 - b. Amount of total expenses recorded in the ledger.
 - c. Amount of net income for August.
- 5. Determine the increase or decrease in retained earnings for August.

PR 2-3B Journal entries and trial balance

OBJ. 1, 2, 3, 4

On October 1, 2016, Jay Pryor established an interior decorating business, Pioneer Designs. During the month, Jay completed the following transactions related to the business:

- Oct. 1. Jay transferred cash from a personal bank account to an account to be used for the business in exchange for common stock, \$18,000.
 - 4. Paid rent for period of October 4 to end of month, \$3,000.
 - 10. Purchased a used truck for \$23,750, paying \$3,750 cash and giving a note payable for the remainder.
 - 13. Purchased equipment on account, \$10,500.
 - 14. Purchased supplies for cash, \$2,100.
 - 15. Paid annual premiums on property and casualty insurance, \$3,600.
 - 15. Received cash for job completed, \$8,950.

Enter the following transactions on Page 2 of the two-column journal:

- 21. Paid creditor a portion of the amount owed for equipment purchased on October 13, \$2,000.
- 24. Recorded jobs completed on account and sent invoices to customers, \$14,150.
- 26. Received an invoice for truck expenses, to be paid in November, \$700.
- 27. Paid utilities expense, \$2,240.

(Continued)





General Ledger



✓ 3. Total of Credit column: \$70,300



General Ledger



- Oct. 27. Paid miscellaneous expenses, \$1,100.
 - 29. Received cash from customers on account, \$7,600.
 - 30. Paid wages of employees, \$4,800.
 - 31. Paid dividends, \$3,500.

Instructions

1. Journalize each transaction in a two-column journal beginning on Page 1, referring to the following chart of accounts in selecting the accounts to be debited and credited. (Do not insert the account numbers in the journal at this time.) Journal entry explanations may be omitted.

11 Cash	31	Common Stock
12 Accounts Receivable	33	Dividends
13 Supplies	41	Fees Earned
14 Prepaid Insurance	51	Wages Expense
16 Equipment	53	Rent Expense
18 Truck	54	Utilities Expense
21 Notes Payable	55	Truck Expense
22 Accounts Payable	59	Miscellaneous Expens

- 2. Post the journal to a ledger of four-column accounts, inserting appropriate posting references as each item is posted. Extend the balances to the appropriate balance columns after each transaction is posted.
- 3. Prepare an unadjusted trial balance for Pioneer Designs as of October 31, 2016.
- 4. Determine the excess of revenues over expenses for October.
- 5. Can you think of any reason why the amount determined in (4) might not be the net income for October?

PR 2-4B Journal entries and trial balance

OBJ. 1, 2, 3, 4

Valley Realty acts as an agent in buying, selling, renting, and managing real estate. The unadjusted trial balance on July 31, 2016, follows:

Valley Realty Unadjusted Trial Balance July 31, 2016

		Debit Balances	Credit Balances
11	Cash	52,500	
12	Accounts Receivable	100,100	
13	Prepaid Insurance	12,600	
14	Office Supplies	2,800	
16	Land	_	
21	Accounts Payable		21,000
22	Unearned Rent		_
23	Notes Payable		_
31	Common Stock		17,500
32	Retained Earnings		70,000
33	Dividends	44,800	
41	Fees Earned		591,500
51	Salary and Commission Expense	385,000	
52	Rent Expense	49,000	
53	Advertising Expense	32,200	
54	Automobile Expense	15,750	
59	Miscellaneous Expense	5,250	
		700,000	700,000

The following business transactions were completed by Valley Realty during August 2016:

- Aug. 1. Purchased office supplies on account, \$3,150.
 - 2. Paid rent on office for month, \$7,200.
 - 3. Received cash from clients on account, \$83,900.

✓ 4. Total of Debit column: \$945,000

General Ledger

- Aug. 5. Paid insurance premiums, \$12,000.
 - 9. Returned a portion of the office supplies purchased on August 1, receiving full credit for their cost, \$400.
 - 17. Paid advertising expense, \$8,000.
 - 23. Paid creditors on account, \$13,750.

Enter the following transactions on Page 19 of the two-column journal:

- 29. Paid miscellaneous expenses, \$1,700.
- 30. Paid automobile expense (including rental charges for an automobile), \$2,500.
- 31. Discovered an error in computing a commission during July; received cash from the salesperson for the overpayment, \$2,000.
- 31. Paid salaries and commissions for the month, \$53,000.
- 31. Recorded revenue earned and billed to clients during the month, \$183,500.
- 31. Purchased land for a future building site for \$75,000, paying \$7,500 in cash and giving a note payable for the remainder.
- 31. Paid dividends, \$1,000.
- 31. Rented land purchased on August 31 to a local university for use as a parking lot during football season (September, October, and November); received advance payment of \$5,000.

Instructions

- 1. Record the August 1 balance of each account in the appropriate balance column of a four-column account, write *Balance* in the item section, and place a check mark (✓) in the Posting Reference column.
- 2. Journalize the transactions for August in a two-column journal beginning on Page 18. Journal entry explanations may be omitted.
- 3. Post to the ledger, extending the account balance to the appropriate balance column after each posting.
- 4. Prepare an unadjusted trial balance of the ledger as of August 31, 2016.
- 5. Assume that the August 31 transaction for dividends should have been \$10,000. (a) Why did the unadjusted trial balance in (4) balance? (b) Journalize the correcting entry. (c) Is this error a transposition or slide?

PR 2-5B Corrected trial balance

OBJ. 4

Tech Support Services has the following unadjusted trial balance as of January 31, 2016:

Tech Support Services Unadjusted Trial Balance January 31, 2016

	Debit Balances	Credit Balances
Cash	25,550	
Accounts Receivable	44,050	
Supplies	6,660	
Prepaid Insurance	3,600	
Equipment	162,000	
Notes Payable		75,000
Accounts Payable		13,200
Common Stock		18,000
Retained Earnings		83,850
Dividends	33,000	
Fees Earned		534,000
Wages Expense	306,000	
Rent Expense	62,550	
Advertising Expense	23,850	
Gas, Electricity, and Water Expense	17,000	
	684,260	724,050

(Continued)

✓ 1. Total of Debit column: \$712,500

The debit and credit totals are not equal as a result of the following errors:

- a. The cash entered on the trial balance was overstated by \$8,000.
- b. A cash receipt of \$4,100 was posted as a debit to Cash of \$1,400.
- c. A debit of \$12,350 to Accounts Receivable was not posted.
- d. A return of \$235 of defective supplies was erroneously posted as a \$325 credit to Supplies.
- e. An insurance policy acquired at a cost of \$3,000 was posted as a credit to Prepaid Insurance.
- f. The balance of Notes Payable was overstated by \$21,000.
- g. A credit of \$3,450 in Accounts Payable was overlooked when the balance of the account was determined.
- h. A debit of \$6,000 for dividends was posted as a debit to Retained Earnings.
- i. The balance of \$28,350 in Advertising Expense was entered as \$23,850 in the trial balance.
- j. Miscellaneous Expense, with a balance of \$4,600, was omitted from the trial balance.

Instructions

- 1. Prepare a corrected unadjusted trial balance as of January 31, 2016.
- 2. Does the fact that the unadjusted trial balance in (1) is balanced mean that there are no errors in the accounts? Explain.

Continuing Problem

✓ 4. Total of Debit column: \$40,750

General Ledger

The transactions completed by PS Music during June 2016 were described at the end of Chapter 1. The following transactions were completed during July, the second month of the business's operations:

- July 1. Peyton Smith made an additional investment in PS Music in exchange for common stock by depositing \$5,000 in PS Music's checking account.
 - 1. Instead of continuing to share office space with a local real estate agency, Peyton decided to rent office space near a local music store. Paid rent for July, \$1,750.
 - 1. Paid a premium of \$2,700 for a comprehensive insurance policy covering liability, theft, and fire. The policy covers a one-year period.
 - 2. Received \$1,000 on account.
 - 3. On behalf of PS Music, Peyton signed a contract with a local radio station, KXMD, to provide guest spots for the next three months. The contract requires PS Music to provide a guest disc jockey for 80 hours per month for a monthly fee of \$3,600. Any additional hours beyond 80 will be billed to KXMD at \$40 per hour. In accordance with the contract, Peyton received \$7,200 from KXMD as an advance payment for the first two months.
 - 3. Paid \$250 on account.
 - 4. Paid an attorney \$900 for reviewing the July 3 contract with KXMD. (Record as Miscellaneous Expense.)
 - 5. Purchased office equipment on account from Office Mart, \$7,500.
 - 8. Paid for a newspaper advertisement, \$200.
 - 11. Received \$1,000 for serving as a disc jockey for a party.
 - Paid \$700 to a local audio electronics store for rental of digital recording equipment.
 - 14. Paid wages of \$1,200 to receptionist and part-time assistant.

Enter the following transactions on Page 2 of the two-column journal:

- July 16. Received \$2,000 for serving as a disc jockey for a wedding reception.
 - 18. Purchased supplies on account, \$850.
 - Paid \$620 to Upload Music for use of its current music demos in making various music sets.
 - 22. Paid \$800 to a local radio station to advertise the services of PS Music twice daily for the remainder of July.
 - 23. Served as disc jockey for a party for \$2,500. Received \$750, with the remainder due August 4, 2016.
 - 27. Paid electric bill, \$915.
 - 28. Paid wages of \$1,200 to receptionist and part-time assistant.
 - 29. Paid miscellaneous expenses, \$540.
 - 30. Served as a disc jockey for a charity ball for \$1,500. Received \$500, with the remainder due on August 9, 2016.
 - 31. Received \$3,000 for serving as a disc jockey for a party.
 - 31. Paid \$1,400 royalties (music expense) to National Music Clearing for use of various artists' music during July.
 - 31. Paid dividends, \$1,250.

PS Music's chart of accounts and the balance of accounts as of July 1, 2016 (all normal balances), are as follows:

11 Cash	\$3,920	41 Fees Earned	\$6,200
12 Accounts Receivable	1,000	50 Wages Expense	400
14 Supplies	170	51 Office Rent Expense	800
15 Prepaid Insurance	_	52 Equipment Rent Expense	675
17 Office Equipment	_	53 Utilities Expense	300
21 Accounts Payable	250	54 Music Expense	1,590
23 Unearned Revenue	_	55 Advertising Expense	500
31 Common Stock	4,000	56 Supplies Expense	180
33 Dividends	500	59 Miscellaneous Expense	415

Instructions

- 1. Enter the July 1, 2016, account balances in the appropriate balance column of a four-column account. Write *Balance* in the Item column, and place a check mark (✓) in the Posting Reference column. (*Hint:* Verify the equality of the debit and credit balances in the ledger before proceeding with the next instruction.)
- 2. Analyze and journalize each transaction in a two-column journal beginning on Page 1, omitting journal entry explanations.
- 3. Post the journal to the ledger, extending the account balance to the appropriate balance column after each posting.
- 4. Prepare an unadjusted trial balance as of July 31, 2016.

Cases & Projects



CP 2-1 Ethics and professional conduct in business

At the end of the current month, Gil Frank prepared a trial balance for College App Services. The credit side of the trial balance exceeds the debit side by a significant amount. Gil has decided to add the difference to the balance of the miscellaneous expense account in order to complete the preparation of the current month's financial statements by a 5 o'clock deadline. Gil will look for the difference next week when he has more time.

Discuss whether Gil is behaving in a professional manner.

CP 2-2 Account for revenue

Bozeman College requires students to pay tuition each term before classes begin. Students who have not paid their tuition are not allowed to enroll or to attend classes.

What journal entry do you think Bozeman College would use to record the receipt of the students' tuition payments? Describe the nature of each account in the entry.

CP 2-3 Record transactions

The following discussion took place between Tony Cork, the office manager of Hallmark Data Company, and a new accountant, Cassie Miles:

Cassie: I've been thinking about our method of recording entries. It seems that it's inefficient.

Tony: In what way?

Cassie: Well—correct me if I'm wrong—it seems like we have unnecessary steps in the process. We could easily develop a trial balance by posting our transactions directly into the ledger and bypassing the journal altogether. In this way, we could combine the recording and posting process into one step and save ourselves a lot of time. What do you think?

Tony: We need to have a talk.



What should Tony say to Cassie?

CP 2-4 Debits and credits

Group Project

The following excerpt is from a conversation between Kate Purvis, the president and chief operating officer of Light House Company, and her neighbor, Dot Evers:

Dot: Kate, I'm taking a course in night school, "Intro to Accounting." I was wondering—could you answer a couple of questions for me?

Kate: Well, I will if I can.

Dot: Okay, our instructor says that it's critical we understand the basic concepts of accounting, or we'll never get beyond the first test. My problem is with those rules of debit and credit . . . you know, assets increase with debits, decrease with credits, etc.

Kate: Yes, pretty basic stuff. You just have to memorize the rules. It shouldn't be too difficult.

Dot: Sure, I can memorize the rules, but my problem is I want to be sure I understand the basic concepts behind the rules. For example, why can't assets be increased with credits and decreased with debits like revenue? As long as everyone did it that way, why not? It would seem easier if we had the same rules for all increases and decreases in accounts. Also, why is the left side of an account called the debit side? Why couldn't it be called something simple . . . like the "LE" for Left Entry? The right side could be called just "RE" for Right Entry. Finally, why are there just two sides to an entry? Why can't there be three or four sides to an entry?

In a group of four or five, select one person to play the role of Kate and one person to play the role of Dot.

- 1. After listening to the conversation between Kate and Dot, help Kate answer Dot's questions.
- What information (other than just debit and credit journal entries) could the accounting system gather that might be useful to Kate in managing Light House Company?

CP 2-5 Transactions and income statement

Cory Neece is planning to manage and operate Eagle Caddy Service at Canyon Lake Golf and Country Club during June through August 2016. Cory will rent a small maintenance building from the country club for \$500 per month and will offer caddy services, including cart rentals, to golfers. Cory has had no formal training in record keeping.

Cory keeps notes of all receipts and expenses in a shoe box. An examination of Cory's shoe box records for June revealed the following:

- June 1. Transferred \$2,000 from personal bank account to be used to operate the caddy service.
 - 1. Paid rent expense to Canyon Lake Golf and Country Club, \$500.
 - 2. Paid for golf supplies (practice balls, etc.), \$750.

- June 3. Arranged for the rental of 40 regular (pulling) golf carts and 20 gasoline-driven carts for \$3,000 per month. Paid \$600 in advance, with the remaining \$2,400 due June 20.
 - Purchased supplies, including gasoline, for the golf carts on account, \$1,000.
 Canyon Lake Golf and Country Club has agreed to allow Cory to store the gasoline in one of its fuel tanks at no cost.
 - 15. Received cash for services from June 1–15, \$5,400.
 - 17. Paid cash to creditors on account, \$1,000.
 - 20. Paid remaining rental on golf carts, \$2,400.
 - 22. Purchased supplies, including gasoline, on account, \$850.
 - 25. Accepted IOUs from customers on account, \$1,800.
 - 28. Paid miscellaneous expenses, \$395.
 - 30. Received cash for services from June 16-30, \$4,200.
 - 30. Paid telephone and electricity (utilities) expenses, \$340.
 - 30. Paid wages of part-time employees, \$850.
 - 30. Received cash in payment of IOUs on account, \$1,500.
 - 30. Determined the amount of supplies on hand at the end of June, \$675.

Cory has asked you several questions concerning his financial affairs to date, and he has asked you to assist with his record keeping and reporting of financial data.

- a. To assist Cory with his record keeping, prepare a chart of accounts that would be appropriate for Eagle Caddy Service. *Note:* Small businesses such as Eagle Caddy Service are often organized as proprietorships. The accounting for proprietorships is similar to that for a corporation, except that the stockholders' equity accounts differ. Specifically, instead of the account for Common Stock, a capital account entitled Cory Neece, Capital is used to record investments in the business. In addition, instead of a dividends account, withdrawals from the business are debited to Cory Neece, Drawing. A proprietorship has no retained earnings account.
- b. Prepare an income statement for June in order to help Cory assess the profitability of Eagle Caddy Service. For this purpose, the use of T accounts may be helpful in analyzing the effects of each June transaction.
- c. Based on Cory's records of receipts and payments, compute the amount of cash on hand on June 30. For this purpose, a T account for cash may be useful.
- d. A count of the cash on hand on June 30 totaled \$6,175. Briefly discuss the possible causes of the difference between the amount of cash computed in (c) and the actual amount of cash on hand.

CP 2-6 Opportunities for accountants

The increasing complexity of the current business and regulatory environment has created an increased demand for accountants who can analyze business transactions and interpret their effects on the financial statements. In addition, a basic ability to analyze the effects of transactions is necessary to be successful in all fields of business as well as in other disciplines, such as law. To better understand the importance of accounting in today's environment, search the Internet or your local newspaper for job opportunities. One possible Internet site is www.careerbuilder.com. Then do one of the following:

- 1. Print a listing of one or two ads for accounting jobs. Alternatively, bring to class one or two newspaper ads for accounting jobs.
- 2. Print a listing of one or two ads for nonaccounting jobs for which some knowledge of accounting is preferred or necessary. Alternatively, bring to class one or two newspaper ads for such jobs.

Internet Project



The Adjusting Process

Pandora

o you use an Internet-based music service such as **Pandora?** Using playlist-generating algorithms, Pandora predicts a listener's music preferences based on their initial music selections. Pandora selects music they think the listener will enjoy, including music of new artists that match the listener's preferences. Recently, Pandora developed similar comedy-generating algorithms that match a listener's preferences for comedy with more than 1,000 comedians.

Most of Pandora's services are offered free to listeners with only 12.5% of its revenues generated from subscription services. So, where do most of Pandora's revenues come from?

Pandora generates more than 85% of its revenues from selling advertising banners that surround the video displays on its tuner. By analyzing its listener interactions, Pandora identifies

listener age, gender, zip code, and content preferences. These attributes can then be matched with advertiser needs and desires.

When should Pandora record revenue from its advertisers and subscribers? Revenue should be recorded when earned. Advertising revenue is earned as ads are displayed, while subscriber revenue is earned when the service has been delivered to the listener. As a result, companies like Pandora must update their accounting records for such items as unearned advertising and subscription revenue before preparing financial statements.

This chapter describes and illustrates the process by which companies update their accounting records before preparing financial statements. This discussion includes the adjustments for unearned revenues that exist at the end of the accounting period.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe the nature of the adjusting process. Nature of the Adjusting Process The Adjusting Process Types of Accounts Requiring Adjustment	EE 3-1 EE 3-2
Journalize entries for accounts requiring adjustment. Adjusting Entries Prepaid Expenses Unearned Revenues Accrued Revenues Accrued Expenses Depreciation Expense	EE 3-3 EE 3-4 EE 3-5 EE 3-6 EE 3-7
Summarize the adjustment process. Summary of Adjustment Process	EE 3-8
Prepare an adjusted trial balance. Adjusted Trial Balance	EE 3-9
Describe and illustrate the use of vertical analysis in evaluating a company's performance and financial condition. Financial Analysis and Interpretation: Vertical Analysis	EE 3-10
	At a Glance 3 Page 126





accounting. Revenues are recognized when passengers take flights, not when the passenger makes the reservation or pays for the ticket.

Nature of the Adjusting Process

When preparing financial statements, the economic life of the business is divided into time periods. This **accounting period concept** requires that revenues and expenses be reported in the proper period. To determine the proper period, accountants use generally accepted accounting principles (GAAP), which requires the **accrual basis of accounting**.

Under the accrual basis of accounting, revenues are reported on the income statement in the period in which they are earned. For example, revenue is reported when the services are provided to customers. Cash may or may not be received from customers during this period. The accounting concept supporting this reporting of revenues is called the **revenue recognition concept**.

Under accrual accounting, revenues are recognized when services have been performed or products have been delivered to customers. Revenue is measured as assets received, such as cash or accounts receivable, in exchange for a service or product. This process of recording revenues is called **revenue recognition**.

The accounting concept supporting reporting revenues and related expenses in the same period is called the **matching concept**. By matching revenues and expenses, net income or loss for the period is properly reported on the income statement.

Although GAAP requires the accrual basis of accounting, some businesses use the **cash basis of accounting**. Under the cash basis of accounting, revenues and expenses are reported on the income statement in the period in which cash is received or paid. For example, fees are recorded when cash is received from clients; likewise, wages are recorded when cash is paid to employees. The net income (or net loss) is the difference between the cash receipts (revenues) and the cash payments (expenses).

Small service businesses may use the cash basis because they have few receivables and payables. For example, attorneys, physicians, and real estate agents often use the cash basis. For them, the cash basis provides financial statements similar to those of the accrual basis. For most large businesses, however, the cash basis will not provide accurate financial statements for user needs. For this reason, the accrual basis is used in this text.

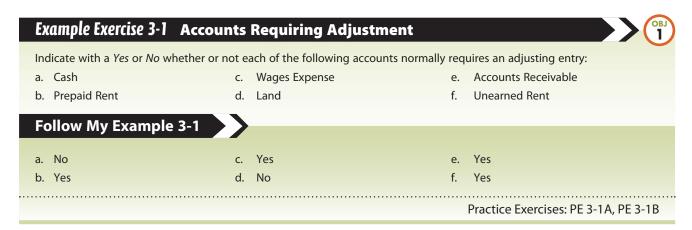
¹ Revenues may involve contracts with customers that have several elements or performance obligations. Recording of revenues under such contracts is described and illustrated in Appendix D.

The Adjusting Process

At the end of the accounting period, many of the account balances in the ledger are reported in the financial statements without change. For example, the balances of the cash and land accounts are normally the amounts reported on the balance sheet. Some accounts, however, require updating for the following reasons:²

- Some expenses are not recorded daily. For example, the daily use of supplies would require many entries with small amounts. Also, the amount of supplies on hand on a day-to-day basis is normally not needed.
- Some revenues and expenses are incurred as time passes rather than as separate transactions. For example, rent received in advance (unearned rent) expires and becomes revenue with the passage of time. Likewise, prepaid insurance expires and becomes an expense with the passage of time.
- Some revenues and expenses may be unrecorded. For example, a company may have provided services to customers that it has not billed or recorded at the end of the accounting period. Likewise, a company may not pay its employees until the next accounting period even though the employees have earned their wages in the current period.

The analysis and updating of accounts at the end of the period before the financial statements are prepared is called the **adjusting process**. The journal entries that bring the accounts up to date at the end of the accounting period are called **adjusting entries**. All adjusting entries affect at least one income statement account and one balance sheet account. Thus, an adjusting entry will *always* involve a revenue or an expense account *and* an asset or a liability account.



Types of Accounts Requiring Adjustment

The following basic types of accounts require adjusting entries:

Prepaid expenses

Accrued revenues

Unearned revenues

Accrued expenses

Prepaid Expenses Prepaid expenses are the advance payment of *future* expenses and are recorded as assets when cash is paid. Prepaid expenses become expenses over time or during normal operations. To illustrate, the following transaction of **NetSolutions** from Chapter 2 is used:

Dec. 1 NetSolutions paid \$2,400 as a premium on a one-year insurance policy.

On December 1, the cash payment of \$2,400 was recorded as a debit to Prepaid Insurance and credit to Cash for \$2,400. At the end of December, only \$200 ($\$2,400 \div 12$ months)

² Under the cash basis of accounting, accounts do not require adjusting. This is because transactions are recorded only when cash is received or paid. Thus, the matching concept is not used under the cash basis.

Impact

of the insurance premium is expired and has become an expense. The remaining \$2,200 of prepaid insurance will become an expense in future months. Thus, the \$200 is insurance expense of December and should be recorded with an adjusting entry.

Other examples of prepaid expenses include supplies, prepaid advertising, and prepaid interest.

Exhibit 1 summarizes the nature of prepaid expenses.

EXHIBIT 1 Prepaid Expenses Transaction Cash is paid in advance for an expense. Advance payments of future expenses are recorded as assets when the cash is paid. The transaction is recorded as a debit to a prepaid expense account and Analysis a credit to the cash account. **Prepaid Expense** XXX Journal Entry XXX Cash Paid an expense in advance. **Assets** Liabilities Stockholders' Equity Accounting **Equation** Cash **Impact Prepaid Expense** Adjustment An end-of-period adjustment is needed to update the prepaid expense account. The prepaid expense account is decreased (credited) for the amount of the Analysis prepaid expense that has expired or has been used, and the related expense account is increased (debited). Adjusting Expense XXX**Prepaid Expense** XXXJournal Entry Adjustment for prepaid expense. Liabilities Stockholders' Equity (Expense) Accounting Assets **Equation Expense Prepaid Expense**

Unearned Revenues Unearned revenues are the advance receipt of *future* revenues and are recorded as liabilities when cash is received. Unearned revenues become earned revenues over time or during normal operations. To illustrate, the following December 1 transaction of **NetSolutions** is used:

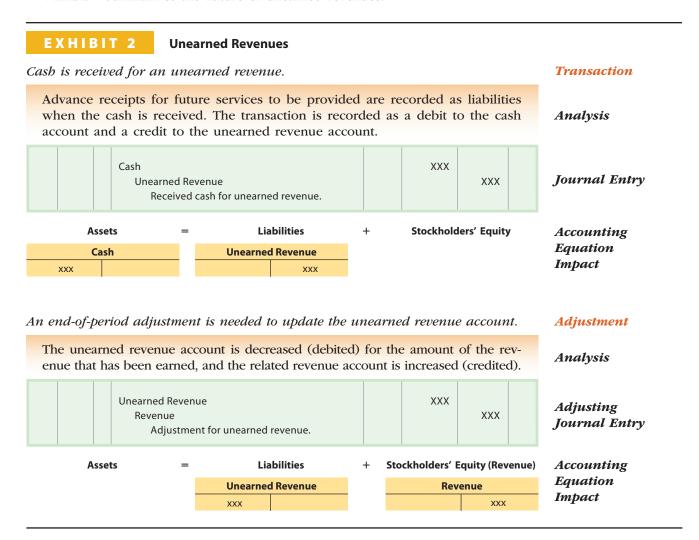
XXX

Dec. 1 NetSolutions received \$360 from a local retailer to rent land for three months.

On December 1, the cash receipt of \$360 was recorded as a debit to Cash and a credit to Unearned Rent for \$360. At the end of December, \$120 (\$360 divided by 3 months) of the unearned rent has been earned. The remaining \$240 will become rent revenue in future months. Thus, the \$120 is rent revenue of December and should be recorded with an adjusting entry.

Other examples of unearned revenues include tuition received in advance by a school, an annual retainer fee received by an attorney, premiums received in advance by an insurance company, and magazine subscriptions received in advance by a publisher.

Exhibit 2 summarizes the nature of unearned revenues.



Accrued Revenues Accrued revenues are unrecorded revenues that have been earned and for which cash has yet to be received. Fees for services that an attorney or a doctor has provided but not yet billed are accrued revenues. To illustrate, the following example involving **NetSolutions** and one of its customers is used:

Dec. 15 NetSolutions signed an agreement with Dankner Co. under which NetSolutions will bill Dankner Co. on the fifteenth of each month for services rendered at the rate of \$20 per hour.

From December 16–31, NetSolutions provided 25 hours of service to Dankner Co. Although the revenue of \$500 (25 hours \times \$20) has been earned, it will not be billed until January 15. Likewise, cash of \$500 will not be received until Dankner pays its bill. Thus, the \$500 of accrued revenue and the \$500 of fees earned should be recorded with an adjusting entry on December 31.

Other examples of accrued revenues include accrued interest on notes receivable and accrued rent on property rented to others.

Exhibit 3 summarizes the nature of accrued revenues.

EXHIBIT 3 **Accrued Revenues** Revenue has been earned but has not been recorded. **Transaction** Revenues have been earned, but the revenue has not been recorded nor has cash been received. No journal entry has been recorded even though revenues Analysis have been earned. Journal Entry No entry has been recorded. **Assets** Liabilities Stockholders' Equity Accounting **Equation** No impact, since the revenue has not been recorded. **Impact** An end-of-period adjustment is needed to recognize accrued revenue. Adjustment An asset account is increased (debited) for the amount of the revenue that has been earned, and the related revenue account is increased (credited). The type of receivable account that is debited depends upon the type of revenue. Analysis For example, Accounts Receivable would be debited for fees earned. Interest Receivable would be debited for interest earned. Asset (Receivable) XXXAdjusting Revenue XXXJournal Entry Adjustment for accrued revenue. Liabilities Stockholders' Equity (Revenue) Assets Accounting **Equation** Receivable Revenue **Impact** XXX XXX

Accrued Expenses Accrued expenses are unrecorded expenses that have been incurred and for which cash has yet to be paid. Wages owed to employees at the end of a period but not yet paid are an accrued expense. To illustrate, the following example involving **NetSolutions** and its employees is used:

Dec. 31 NetSolutions owes its employees wages of \$250 for Monday and Tuesday, December 30 and 31.

NetSolutions paid wages of \$950 on December 13 and \$1,200 on December 27, 2015. These payments covered the biweekly pay periods that ended on those days. As of December 31, 2015, NetSolutions owes its employees wages of \$250 for Monday and Tuesday, December 30 and 31. The wages of \$250 will be paid on January 10, 2016; however, they are an expense of December. Thus, \$250 of accrued wages should be recorded with an adjusting entry on December 31.

Other examples of accrued expenses include accrued interest on notes payable and accrued taxes.

Exhibit 4 summarizes the nature of accrued expenses.

Stockholders' Equity

EXHIBIT 4

Assets

Accrued Expenses

An expense has been incurred but has not been recorded.

An expense has been incurred, but the expense has not been recorded nor has cash been paid. No journal entry has been recorded even though an expense has been incurred.

Analysis

Transaction

No entry has been recorded.

Journal Entry

= Liabilities +
No impact, since the expense has not been recorded.

Accounting Equation Impact

An end-of-period adjustment is needed to recognize the accrued expense.

Adjustment

An expense account is increased (debited) for the amount of the expense that has been incurred, and the related liability account is increased (credited). The liability account that is credited depends upon the type of expense. For example, Wages Payable would be credited for wages expense. Interest Payable would be credited for interest expense.

Analysis



Adjusting Journal Entry

Assets = Liabilities + Stockholders' Equity (Expense)

Payable Expense

XXX

XXX

Accounting Equation Impact

Accruals Versus Deferrals As illustrated in Exhibit 3, accrued revenues are earned revenues that are unrecorded. The cash receipts for accrued revenues are normally received in the next accounting period. As illustrated in Exhibit 4, accrued expenses are expenses that have been incurred but are unrecorded. The cash payments for accrued expenses are normally paid in the next accounting period.

Prepaid expenses and unearned revenues are sometimes referred to as *defer-* rals. This is because the recording of the related expense or revenue is deferred to a future period. Accrued revenues and accrued expenses are sometimes referred to as accruals. This is because the related revenue or expense should be recorded or accrued in the current period.

Example Exercise 3-2 Type of Adjustment



Classify the following items as (1) prepaid expense, (2) unearned revenue, (3) accrued expense, or (4) accrued revenue:

- a. Wages owed but not yet paid.
- c. Fees received but not yet earned.

b. Supplies on hand.

d. Fees earned but not yet received.

Follow My Example 3-2

a. Accrued expense

c. Unearned revenue

b. Prepaid expense

d. Accrued revenue

Practice Exercises: PE 3-2A, PE 3-2B



Adjusting Entries

To illustrate adjusting entries, the December 31, 2015, unadjusted trial balance of **NetSolutions**, shown in Exhibit 5, is used. An expanded chart of accounts for NetSolutions is shown in Exhibit 6. The additional accounts used in this chapter are highlighted. The rules of debit and credit shown in Exhibit 3 of Chapter 2 are used to record the adjusting entries.

EXHIBIT 5

Unadjusted Trial Balance for NetSolutions

NetSolutions Unadjusted Trial Balance December 31, 2015		
	Debit Balances	Credit Balances
Cash Accounts Receivable Supplies Prepaid Insurance Land Office Equipment Accounts Payable Unearned Rent Common Stock Dividends Fees Earned Wages Expense Supplies Expense Rent Expense Utilities Expense Miscellaneous Expense	2,065 2,220 2,000 2,400 20,000 1,800 4,000 4,275 800 1,600 985 455 42,600	900 360 25,000 16,340

EXHIBIT 6

Expanded Chart of Accounts for NetSolutions

Balance Sheet Accounts Income Statement Accounts 1. Assets 4. Revenue 11 Cash 41 Fees Earned 12 Accounts Receivable 42 Rent Revenue 14 Supplies 5. Expenses 15 Prepaid Insurance 51 Wages Expense 17 Land 52 Supplies Expense 18 Office Equipment 53 Rent Expense 19 Accumulated Depreciation—Office Equipment 54 Utilities Expense 2. Liabilities 55 Insurance Expense 21 Accounts Payable 56 Depreciation Expense 22 Wages Payable 59 Miscellaneous Expense 23 Unearned Rent 3. Stockholders' Equity 31 Common Stock 32 Retained Earnings 33 Dividends

Prepaid Expenses

Supplies The December 31, 2015, unadjusted trial balance of **NetSolutions** indicates a balance in the supplies account of \$2,000. In addition, the prepaid insurance account has a balance of \$2,400. Each of these accounts requires an adjusting entry.

The balance in NetSolutions' supplies account on December 31 is \$2,000. Some of these supplies (CDs, paper, envelopes, etc.) were used during December, and some

are still on hand (not used). If either amount is known, the other can be determined. It is normally easier to determine the cost of the supplies on hand at the end of the month than to record daily supplies used.

Assuming that on December 31 the amount of supplies on hand is \$760, the amount to be transferred from the asset account to the expense account is \$1,240, computed as follows:

Supplies available during December (balance of account) \$2,000
Supplies on hand, December 31 760
Supplies used (amount of adjustment) \$1,240

At the end of December, the supplies expense account is increased (debited) for \$1,240, and the supplies account is decreased (credited) for \$1,240 to record the supplies used during December. The adjusting journal entry and T accounts for Supplies and Supplies Expense are as follows:

Journal Page 5								
Date	•	Description	Post. Ref.	Debit	Credit			
²⁰¹⁵ Dec.	31	Supplies Expense Supplies Supplies used (\$2,000 – \$760).	52 14	1,240	1,240			
Assets = Liabilities + Stockholders' Equity (Expense)								

Supplies

Dec. 31

2,000

760

Bal.

Adj. Bal.

Adjusting Journal Entry

Accounting Equation Impact

52

Supplies Expense

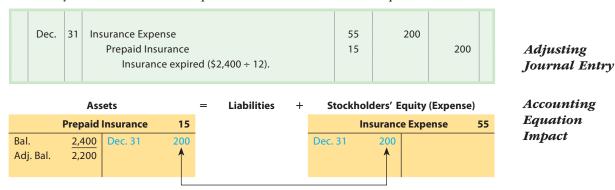
800

1,240

2,040

The adjusting entry is shown in color in the T accounts to separate it from other transactions. After the adjusting entry is recorded and posted, the supplies account has a debit balance of \$760. This balance is an asset that will become an expense in a future period.

Prepaid Insurance The debit balance of \$2,400 in **NetSolutions**' prepaid insurance account represents a December 1 prepayment of insurance for 12 months. At the end of December, the insurance expense account is increased (debited), and the prepaid insurance account is decreased (credited) by \$200, the insurance for one month. The adjusting journal entry and T accounts for Prepaid Insurance and Insurance Expense are as follows:



Bal.

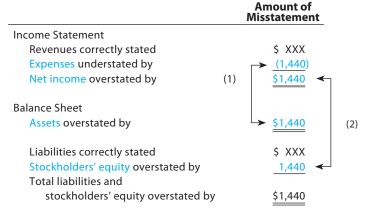
Dec. 31

Adj. Bal.

After the adjusting entry is recorded and posted, the prepaid insurance account has a debit balance of \$2,200. This balance is an asset that will become an expense in future periods. The insurance expense account has a debit balance of \$200, which is an expense of the current period.

If the preceding adjustments for supplies (\$1,240) and insurance (\$200) are not recorded, the financial statements prepared as of December 31 will be misstated. On the income statement, Supplies Expense and Insurance Expense will be understated

by a total of \$1,440 (\$1,240 + \$200), and net income will be overstated by \$1,440. On the balance sheet, Supplies and Prepaid Insurance will be overstated by a total of \$1,440. Because net income increases retained earnings, stockholders' equity will also be overstated by \$1,440 on the balance sheet. The effects of omitting these adjusting entries on the income statement and balance sheet are as follows:



Arrow (1) indicates the effect of the understated expenses on assets. Arrow (2) indicates the effect of the overstated net income on stockholders' equity.

Payments for prepaid expenses are sometimes made at the beginning of the period in which they will be *entirely used or consumed*. To illustrate, the following December 1 transaction of NetSolutions is used:

Dec. 1 NetSolutions paid rent of \$800 for the month.

On December 1, the rent payment of \$800 represents Prepaid Rent. However, the Prepaid Rent expires daily, and at the end of December there will be no asset left. In such cases, the payment of \$800 is recorded as Rent Expense rather than as Prepaid Rent. In this way, no adjusting entry is needed at the end of the period.³

Example Exercise 3-3 Adjustment for Prepaid Expense



The prepaid insurance account had a beginning balance of \$6,400 and was debited for \$3,600 of premiums paid during the year. Journalize the adjusting entry required at the end of the year, assuming the amount of unexpired insurance related to future periods is \$3,250.

Follow My Example 3-3

 Insurance Expense
 6,750

 Prepaid Insurance
 6,750

 Insurance expired (\$6,400 + \$3,600 - \$3,250).
 6,750

Practice Exercises: PE 3-3A, PE 3-3B

Integrity, Objectivity, and Ethics in Business



FREE ISSUE

Office supplies are often available to employees on a "free issue" basis. This means that employees do not have to "sign" for the release of office supplies but merely obtain the necessary supplies from a local storage area as

needed. Just because supplies are easily available, however, doesn't mean they can be taken for personal use. There are many instances where employees have been terminated for taking supplies home for personal use.

³ An alternative treatment of recording the cost of supplies, rent, and other prepayments of expenses is discussed in an appendix that can be downloaded from the book's companion Web site (www.cengagebrain.com).

Unearned Revenues

The December 31 unadjusted trial balance of **NetSolutions** indicates a balance in the unearned rent account of \$360. This balance represents the receipt of three months' rent on December 1 for December, January, and February. At the end of December, one month's rent has been earned. Thus, the unearned rent account is decreased (debited) by \$120, and the rent revenue account is increased (credited) by \$120. The \$120 represents the rental revenue for one month ($$360 \div 3$). The adjusting journal entry and T accounts are as follows:

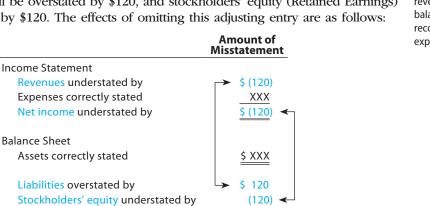


After the adjusting entry is recorded and posted, the unearned rent account has a credit balance of \$240. This balance is a liability that will become revenue in a future period. Rent Revenue has a balance of \$120, which is revenue of the current period.⁴

If the preceding adjustment of unearned rent and rent revenue is not recorded, the financial statements prepared on December 31 will be misstated. On the income statement, Rent Revenue and the net income will be understated by \$120. On the balance sheet, liabilities (Unearned Rent) will be overstated by \$120, and stockholders' equity (Retained Earnings) will be understated by \$120. The effects of omitting this adjusting entry are as follows:

Total liabilities and

stockholders' equity correctly stated



\$ XXX

Adjusting Journal Entry

Accounting Equation Impact



terms between 12 and 36 months. The receipts from sales of these contracts are reported as unearned revenue on Best Buy's balance sheet. Revenue is recorded as the contracts expire.

The balance in the unearned fees account, before adjustment at the end of the year, is \$44,900. Journalize the adjusting entry required if the amount of unearned fees at the end of the year is \$22,300. Follow My Example 3-4 Unearned Fees. Fees Earned Fees Earned 22,600 Fees earned (\$44,900 - \$22,300). Practice Exercises: PE 3-4A, PE 3-4B

⁴ An alternative treatment of recording revenues received in advance of their being earned is discussed in an appendix that can be downloaded from the book's companion Web site (www.cengagebrain.com).



Business Connection

NATIONAL FITNESS CENTER: UPFRONT FEES

National Fitness Center imposes a nonrefundable upfront fee on some of its multiyear club memberships. Should the fee be recognized as revenue when the club receives the fee?

The upfront fee is like an advance payment made by customers for use of the club facilities. The company earns these fees over time as customers work out and use the facilities. Thus, the initial fee is unearned when received by the club and becomes earned revenue over time.5 As a result, each month the club records revenue from club dues that are paid monthly as well as from a portion of upfront (prepaid) dues.

Accrued Revenues



consumer electronics retailing. RadioShack accrues revenue for finance charges and late payment charges related to its credit operations.

During an accounting period, some revenues are recorded only when cash is received. Thus, at the end of an accounting period, there may be revenue that has been earned but has not been recorded. In such cases, the revenue is recorded by increasing (debiting) an asset account and increasing (crediting) a revenue account.

To illustrate, assume that NetSolutions signed an agreement with Dankner Co. on December 15. The agreement provides that NetSolutions will answer computer questions and render assistance to Dankner Co.'s employees. The services will be billed to Dankner Co. on the fifteenth of each month at a rate of \$20 per hour. As of December 31, NetSolutions had provided 25 hours of assistance to Dankner Co. The revenue of \$500 (25 hours \times \$20) will be billed on January 15. However, NetSolutions earned the revenue in December.

The claim against the customer for payment of the \$500 is an account receivable (an asset). Thus, the accounts receivable account is increased (debited) by \$500, and the fees earned account is increased (credited) by \$500. The adjusting journal entry and T accounts are as follows:

Adjusting Journal Entry

Accounting **Equation Impact**



Accounts Receivable 12 **Fees Earned** 41 2,220 Bal. 16,340 Dec. 31 500 500 Dec. 31 Adj. Bal. 2,720 Adj. Bal. 16,840

If the adjustment for the accrued revenue (\$500) is not recorded, Fees Earned and the net income will be understated by \$500 on the income statement. On the balance sheet, assets (Accounts Receivable) and stockholders' equity (Retained Earnings) will be understated by \$500. The effects of omitting this adjusting entry are as follows:

Amount of Misstatement Income Statement Revenues understated by \$ (500) Expenses correctly stated XXX \$ (500) Net income understated by **Balance Sheet** Assets understated by \$ (500) \$ XXX Liabilities correctly stated Stockholders' equity understated by (500)Total liabilities and stockholders' equity understated by \$ (500)

⁵FASB Exposure Draft, Revenue Recognition (Topic 605), June 24, 2010, para. IG29-IG32

Example Exercise 3-5 Adjustment for Accrued Revenues	
At the end of the current year, \$13,680 of fees have been earned but have not bee adjusting entry to record the accrued fees.	n billed to clients. Journalize the
Follow My Example 3-5 Accounts Receivable	13,680 13.680
Accrued fees.	13,000
	Practice Exercises: PE 3-5A, PE 3-5B

Accrued Expenses

Some types of services used in earning revenues are paid for *after* the service has been performed. For example, wages expense is used hour by hour but is paid only daily, weekly, biweekly, or monthly. At the end of the accounting period, the amount of such *accrued* but unpaid items is an expense and a liability.

For example, if the last day of the employees' pay period is not the last day of the accounting period, an accrued expense (wages expense) and the related liability (wages payable) must be recorded by an adjusting entry. This adjusting entry is necessary so that expenses are properly matched to the period in which they were incurred in earning revenue.

To illustrate, **NetSolutions** pays its employees biweekly. During December, NetSolutions paid wages of \$950 on December 13 and \$1,200 on December 27. These payments covered pay periods ending on those days as shown in Exhibit 7.



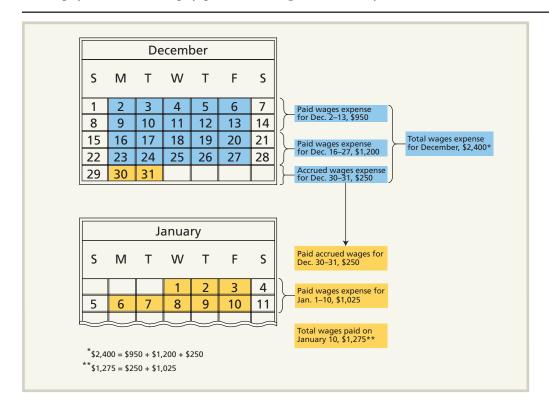


EXHIBIT 7

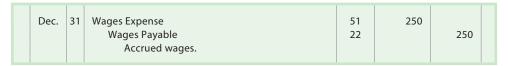
Accrued Wages



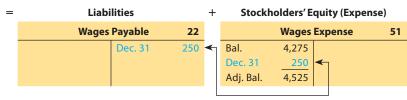
As of December 31, NetSolutions owes \$250 of wages to employees for Monday and Tuesday, December 30 and 31. Thus, the wages expense account is increased (debited) by \$250, and the wages payable account is increased (credited) by \$250. The adjusting journal entry and T accounts are as follows:

Assets





Accounting Equation Impact

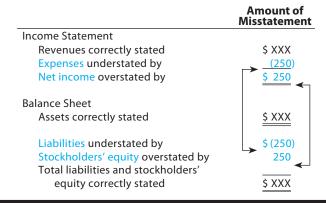


After the adjusting entry is recorded and posted, the debit balance of the wages expense account is \$4,525. This balance of \$4,525 is the wages expense for two months, November and December. The credit balance of \$250 in Wages Payable is the liability for wages owed on December 31.

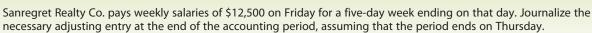
As shown in Exhibit 7, NetSolutions paid wages of \$1,275 on January 10. This payment includes the \$250 of accrued wages recorded on December 31. Thus, on January 10, the wages payable account is decreased (debited) by \$250. Also, the wages expense account is increased (debited) by \$1,025 (\$1,275 - \$250), which is the wages expense for January 1–10. Finally, the cash account is decreased (credited) by \$1,275. The journal entry for the payment of wages on January 10 follows:

	Jan.	10	Wages Expense Wages Payable	51 22	1,025 250	1 275	
1			Cash	11		1,275	

If the adjustment for wages (\$250) is not recorded, Wages Expense will be understated by \$250, and the net income will be overstated by \$250 on the income statement. On the balance sheet, liabilities (Wages Payable) will be understated by \$250, and stockholders' equity (Retained Earnings) will be overstated by \$250. The effects of omitting this adjusting entry are as follows:



Example Exercise 3-6 Adjustment for Accrued Expense



Fol	low	My	Exam	ple	3-6	

 Salaries Expense
 10,000

 Salaries Payable
 10,000

 Accrued salaries [(\$12,500 ÷ 5 days) × 4 days].
 10,000

Practice Exercises: PE 3-6A, PE 3-6B

⁶To simplify the subsequent recording of the following period's transactions, some accountants use what is known as reversing entries for certain types of adjustments. Reversing entries are discussed and illustrated in Appendix E, which is available on the product Web site at www.cengagebrain.com.

Depreciation Expense

Fixed assets, or **plant assets**, are physical resources that are owned and used by a business and are permanent or have a long life. Examples of fixed assets include land, buildings, and equipment. In a sense, fixed assets are a type of *long-term* prepaid expense. However, because of their unique nature and long life, they are discussed separately from other prepaid expenses.

Fixed assets, such as office equipment, are used to generate revenue much like supplies are used to generate revenue. Unlike supplies, however, there is no visible reduction in the quantity of the equipment. Instead, as time passes, the equipment loses its ability to provide useful services. This decrease in usefulness is called **depreciation**.

All fixed assets, except land, lose their usefulness and, thus, are said to **depreciate**. As a fixed asset depreciates, a portion of its cost should be recorded as an expense. This periodic expense is called **depreciation expense**.

The adjusting entry to record depreciation expense is similar to the adjusting entry for supplies used. The depreciation expense account is increased (debited) for the amount of depreciation. However, the fixed asset account is not decreased (credited). This is because both the original cost of a fixed asset and the depreciation recorded since its purchase are reported on the balance sheet. Instead, an account entitled **Accumulated Depreciation** is increased (credited).

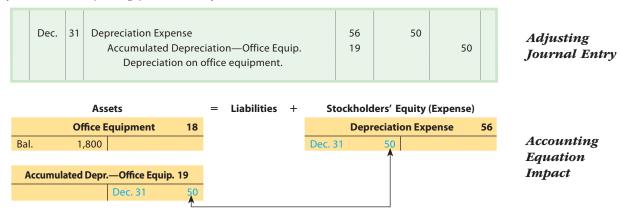
Accumulated depreciation accounts are called **contra accounts**, or **contra asset accounts**. This is because accumulated depreciation accounts are deducted from their related fixed asset accounts on the balance sheet. The normal balance of a contra account is opposite to the account from which it is deducted. Because the normal balance of a fixed asset account is a debit, the normal balance of an accumulated depreciation account is a credit.

The normal titles for fixed asset accounts and their related contra asset accounts are as follows:

Companies,
Inc., reported
land, buildings, and store
equipment at a cost
of \$34,332 million and
accumulated depreciation of
\$12,362 million.

Fixed Asset Account	Contra Asset Account
Land	None—Land is not depreciated.
Buildings	Accumulated Depreciation—Buildings
Store Equipment	Accumulated Depreciation—Store Equipment
Office Equipment	Accumulated Depreciation—Office Equipment

The December 31, 2015, unadjusted trial balance of **NetSolutions** (Exhibit 5) indicates that NetSolutions owns two fixed assets: land and office equipment. Land does not depreciate; however, an adjusting entry is recorded for the depreciation of the office equipment for December. Assume that the office equipment depreciates \$50 during December. The depreciation expense account is increased (debited) by \$50, and the accumulated depreciation—office equipment account is increased (credited) by \$50.7 The adjusting journal entry and T accounts are as follows:



After the adjusting journal entry is recorded and posted, the office equipment account still has a debit balance of \$1,800. This is the original cost of the office equipment that

⁷ Methods of computing depreciation expense are described and illustrated in Chapter 9.

was purchased on December 4. The accumulated depreciation—office equipment account has a credit balance of \$50. The difference between these two balances is the cost of the office equipment that has not yet been depreciated. This amount, called the **book value** of the asset (or net book value), is computed as follows:

```
Book Value of Asset = Cost of the Asset – Accumulated Depreciation of Asset

Book Value of Office Equipment = Cost of Office Equipment – Accumulated Depr. of Office Equipment

= $1,800 - $50

= $1,750
```

The office equipment and its related accumulated depreciation are reported on the December 31, 2015, balance sheet as follows:

Office equipment	\$1,800	
Less accumulated depreciation	50	\$1,750

The market value of a fixed asset usually differs from its book value. This is because depreciation is an *allocation* method, not a *valuation* method. That is, depreciation allocates the cost of a fixed asset to expense over its estimated life. Depreciation does not measure changes in market values, which vary from year to year. Thus, on December 31, 2015, the market value of NetSolutions' office equipment could be more or less than \$1,750.

If the adjustment for depreciation (\$50) is not recorded, Depreciation Expense on the income statement will be understated by \$50, and the net income will be overstated by \$50. On the balance sheet, assets (the book value of Office Equipment) and stockholders' equity (Retained Earnings) will be overstated by \$50. The effects of omitting the adjustment for depreciation are as follows:

	Amount of Misstatement
Income Statement	
Revenues correctly stated	\$ XX
Expenses understated by	<u>→ (50</u>)
Net income overstated by	\$ 50 ←
Balance Sheet	
Assets overstated by	\$ 50
Liabilities correctly stated	\$ XX
Stockholders' equity overstated by	50 ←
Total liabilities and stockholders'	
equity overstated by	\$ 50

Example Exercise 3-7 Adjustment for Depreciation



The estimated amount of depreciation on equipment for the current year is \$4,250. Journalize the adjusting entry to record the depreciation.

Follow My Example 3-7

Practice Exercises: PE 3-7A, PE 3-7B



Summary of Adjustment Process

A summary of the basic types of adjusting entries is shown in Exhibit 8. The adjusting entries for **NetSolutions** are shown in Exhibit 9. The adjusting entries are dated as of the last day of the period. However, because collecting the adjustment data requires

EXHIBIT 8

Summary of Adjustments

PREPAID EXPENSES									
Examples	Reason for Adjustment	Adjusting	Entry	Examples from Ne	tSolutions	Financial Statement Impact if Adjusting Entry Is Omitted			
Supplies, prepaid insurance	Prepaid expenses (assets) have been used or consumed in the business opera- tions.	Expense Asset	Dr.	Supplies Expense Supplies Insurance Expense Prepaid Insurance	1,240 1,240 200 200	Income Statement: Revenues Expenses Net income Balance Sheet: Assets Liabilities Stockholders' equity (Retained earnings)	No effect Understated Overstated Overstated No effect Overstated		
				JNEARNED REVENUES					
Unearned rent, maga- zine sub- scriptions received in advance, fees received in advance of services	Cash received before the services have been provided is recorded as a liability. Some services have been provided to the customer before the end of the accounting period.	Liability Revenue	Dr. Cı	Unearned Rent Rent Revenue	120 120	Income Statement: Revenues Expenses Net income Balance Sheet: Assets Liabilities Stockholders' equity (Retained earnings)	Understated No effect Understated No effect Overstated Understated		
				ACCRUED REVENUES					
Services performed but not billed, inter- est to be received	Services have been provided to the customer, but have not been billed or recorded. Interest has been earned, but has not been received or recorded.	Asset Revenue	Dr.	Accounts Receivable Fees Earned	500	Income Statement: Revenues Expenses Net income Balance Sheet: Assets Liabilities Stockholders' equity (Retained earnings)	Understated No effect Understated Understated No effect Understated		
				ACCRUED EXPENSES					
Wages or salaries incurred but not paid, interest incurred but not paid	Expenses have been incurred, but have not been paid or recorded.	Expense Liability	Dr. Cı	Wages Expense Wages Payable	250 250	Income Statement: Revenues Expenses Net income Balance Sheet: Assets Liabilities Stockholders' equity (Retained earnings)	No effect Understated Overstated No effect Understated Overstated		
				DEPRECIATION					
Depreciation of equipment and buildings	Fixed assets depreciate as they are used or consumed in the business operations.	Expense Contra Asset	Dr. Cı	Depreciation Expense Accum. Depreciation- Office Equipment	50 — 50	Income Statement: Revenues Expenses Net income Balance Sheet: Assets Liabilities Stockholders' equity (Retained earnings)	No effect Understated Overstated Overstated No effect Overstated		

EXHIBIT 9

Adjusting Entries— **NetSolutions**

		Journal			Page 5
Date	Debit	Credit			
²⁰¹⁵ Dec.	31	Adjusting Entries Supplies Expense Supplies Supplies used (\$2,000 – \$760).	52 14	1,240	1,240
	31	Insurance Expense Prepaid Insurance Insurance expired (\$2,400 ÷ 12 months).	55 15	200	200
	Unearned Rent Rent Revenue Rent earned (\$360 ÷ 3 months).		23 42	120	120
	31	Accounts Receivable Fees Earned Accrued fees (25 hrs. \times \$20).	12 41	500	500
	31	Wages Expense Wages Payable Accrued wages.	51 22	250	250
	31	Depreciation Expense Accum. Depreciation—Office Equipment Depreciation on office equipment.	56 19	50	50

An accountant may check whether all adjustments have been made by comparing current period adjustments with those of the prior period.



MICROSOFT CORPORATION

Microsoft Corporation develops, manufactures, licenses, and supports a wide range of computer software products, including Windows Vista®, Windows 7®, Windows XP®, Word®, Excel®, and the Xbox® gaming system. When Microsoft sells its products, it incurs an obligation to support its software with technical support and periodic updates. As

a result, not all the revenue is earned on the date of sale; some of the revenue on the date of sale is unearned. The portion of revenue related to support services, such as updates and technical support, is earned as time passes and support is provided to customers. Thus, each year Microsoft makes adjusting entries transferring some of its unearned revenue to revenue. The following excerpts were taken from recent financial statements of Microsoft:

The percentage of revenue recorded as unearned . . . ranges from approximately 15% to 25% of the sales price for Windows XP Home, approximately 5% to 15% of the sales price for Windows XP Professional, . . .

Unearned Revenue:

	Recent Year	Prior Year
Unearned revenue (in millions)	\$17,120	\$14,830

During the next year, Microsoft expects to record more than \$15,722 million of unearned revenue as revenue. At the same time, Microsoft will record additional unearned revenue from current period sales.

time, the entries are usually recorded at a later date. An explanation is normally included with each adjusting entry.

NetSolutions' adjusting entries are posted to the ledger shown in Exhibit 10. The adjustments are highlighted in Exhibit 10 to distinguish them from other transactions.

EXHIBIT 10

Ledger with Adjusting Entries—NetSolutions

Accou	int Cash		Account	No. 11		
					Bala	ance
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015			25.000		25.000	
Nov. 1		1	25,000	20.000	25,000	
5		1	7.500	20,000	5,000	
18		1	7,500	2.650	12,500	
30		1		3,650	8,850	
30		1		950	7,900	
30		2		2,000	5,900	
Dec. 1		2		2,400	3,500	
1		2		800	2,700	
1		2	360		3,060	
6		2		180	2,880	
11		2		400	2,480	
13		3		950	1,530	
16		3	3,100		4,630	
20		3		900	3,730	
21		3	650		4,380	
23		3		1,450	2,930	
27		3		1,200	1,730	
31		3		310	1,420	
31		4		225	1,195	
31		4	2,870		4,065	
31		4		2,000	2,065	

Accou	I nt Accounts	Account	No. 12			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Dec. 16		3	1,750		1,750	
21		3		650	1,100	
31		4	1,120		2,220	
31	Adjusting	5	500		2,720	

Accou	I nt Supplies		Account No. 14				
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov. 10		1	1,350		1,350		
30		1		800	550		
Dec. 23		3	1,450		2,000		
31	Adjusting	5		1,240	760		

Αссοι	int Prepaid Ir	Account	No. 15			
					Balance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Dec. 1		2	2,400		2,400	
31	Adjusting	5		200	2,200	

Accou	I nt Land	Account	No. 17				
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015 Nov. 5		1	20,000		20,000		

Accou	I nt Office Equ	Account	No. 18			
					Balance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Dec. 4		2	1,800		1,800	

Account Accum. Depr.—Office Equip. Account No. 19							
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Dec. 1	Adjusting	5		50		50	

Accou	I nt Accounts	Account No. 21					
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov. 10		1		1,350		1,350	
30		1	950			400	
Dec. 4		2		1,800		2,200	
11		2	400			1,800	
20		3	900			900	

Account Wages Payable Account No. 22								
					Balance			
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit		
2015								
Dec. 31	Adiustina	5		250		250		

Accou	I nt Unearned		Account	No. 23			
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Dec. 1		2		360		360	
31	Adjusting	5	120			240	

Accou	I nt Common	Account	No. 31				
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov. 1		1		25,000		25,000	

(Continued)

EXHIBIT 10 Ledger with Adjusting Entries—NetSolutions (Concluded)

Accou	I nt Dividend	Account	No. 33				
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov. 30		2	2,000		2,000		
Dec. 31		4	2,000		4,000		

Account Fees Earned Account No. 41								
					Balance			
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit		
2015								
Nov. 18		1		7,500		7,500		
Dec. 16		3		3,100		10,600		
16		3		1,750		12,350		
31		4		2,870		15,220		
31		4		1,120		16,340		
31	Adjusting	5		500		16,840		

Accou	I nt Rent Reve	Account	No. 42			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Dec. 31	Adjusting	5		120		120

Accou	ı nt Wages Ex	Account	No. <i>51</i>			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 30		1	2,125		2,125	
Dec. 13		3	950		3,075	
27		3	1,200		4,275	
31	Adjusting	5	250		4,525	

Accou	I nt Supplies l	Account	No. 52			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 30		1	800		800	
Dec. 31	Adjusting	5	1,240		2,040	
Nov. 30	Adjusting	<u> </u>				

Accou	I nt Rent Expe	Account	No. 53			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 30		1	800		800	
Dec. 1		2	800		1,600	

Account Utilities Expense Account No. 54							
					Bala	nce	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov. 30		1	450		450		
Dec. 31		3	310		760		
31		4	225		985		

Account Insurance Expense Account No. 55							
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Dec. 31	Adjusting	5	200		200		

Accou	Account	No. 56				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Dec. 31	Adjusting	5	50		50	

Account Miscellaneous Expense Account No.							
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov. 30		1	275		275		
Dec. 6		2	180		455		

Example Exercise 3-8 Effect of Omitting Adjustments



For the year ending December 31, 2016, Mann Medical Co. mistakenly omitted adjusting entries for (1) \$8,600 of unearned revenue that was earned, (2) earned revenue of \$12,500 that was not billed, and (3) accrued wages of \$2,900. Indicate the combined effect of the errors on (a) revenues, (b) expenses, and (c) net income for the year ended December 31, 2016.

Follow My Example 3-8

- a. Revenues were understated by \$21,100 (\$8,600 + \$12,500).
- b. Expenses were understated by \$2,900.
- c. Net income was understated by \$18,200 (\$8,600 + \$12,500 \$2,900).

Practice Exercises: PE 3-8A, PE 3-8B

Adjusted Trial Balance



After the adjusting entries are posted, an adjusted trial balance is prepared. The adjusted trial balance verifies the equality of the total debit and credit balances before the financial statements are prepared. If the adjusted trial balance does not balance, an error has occurred. However, as discussed in Chapter 2, errors may occur even though the adjusted trial balance totals agree. For example, if an adjusting entry were omitted, the adjusted trial balance totals would still agree.

Exhibit 11 shows the adjusted trial balance for **NetSolutions** as of December 31, 2015. Chapter 4 discusses how financial statements, including a classified balance sheet, are prepared from an adjusted trial balance.

NetSolutions Adjusted Trial Balance December 31, 2015		
	Debit Balances	Cı Bal

EXHIBIT 11

Adjusted Trial Balance

December 31, 2015		
	Debit Balances	Credit Balances
Cash	2,065 <mark>2,720</mark>	
Supplies	760	
Prepaid Insurance	2,200	
Land	20,000	
Office Equipment	1,800	<mark>50</mark>
Accounts Payable		900
Wages Payable		<mark>250</mark>
Unearned Rent		<mark>240</mark>
Common Stock		25,000
Dividends Fees Earned	4,000	<mark>16,840</mark>
Rent Revenue		120
Wages Expense	<mark>4,525</mark>	
Supplies Expense	<mark>2,040</mark>	
Rent Expense	1,600	
Utilities Expense	985 <mark>200</mark>	
Insurance Expense	<u>200</u> 50	
Miscellaneous Expense	455	
•	43,400	43,400

Example Exercise 3-9 Effect of Errors on Adjusted Trial Balance



For each of the following errors, considered individually, indicate whether the error would cause the adjusted trial balance totals to be unequal. If the error would cause the adjusted trial balance totals to be unequal, indicate whether the debit or credit total is higher and by how much.

- a. The adjustment for accrued fees of \$5,340 was journalized as a debit to Accounts Payable for \$5,340 and a credit to Fees Earned of \$5,340.
- b. The adjustment for depreciation of \$3,260 was journalized as a debit to Depreciation Expense for \$3,620 and a credit to Accumulated Depreciation for \$3,260.

Follow My Example 3-9

- a. The totals are equal even though the debit should have been to Accounts Receivable instead of Accounts Payable.
- b. The totals are unequal. The debit total is higher by \$360 (\$3,620 \$3,260).

Practice Exercises: PE 3-9A, PE 3-9B





Financial Analysis and Interpretation: Vertical Analysis

Comparing each item in a financial statement with a total amount from the same statement is useful in analyzing relationships within the financial statement. **Vertical analysis** is the term used to describe such comparisons.

In vertical analysis of a balance sheet, each asset item is stated as a percent of the total assets. Each liability and stockholders' equity item is stated as a percent of total liabilities and stockholders' equity. In vertical analysis of an income statement, each item is stated as a percent of revenues or fees earned.

Vertical analysis is also useful for analyzing changes in financial statements over time. To illustrate, a vertical analysis of two years of income statements for J. Holmes, Attorney-at-Law, follows:

J. Holmes, Attorney-at-Law Income Statements For the Years Ended December 31

	Year 2		Year 1		
	Amount	Percent*	Amount	Percent*	
Fees earned	\$187,500	100.0%	\$150,000	100.0%	
Operating expenses:					
Wages expense	\$ 60,000	32.0%	\$ 45,000	30.0%	
Rent expense	15,000	8.0	12,000	8.0	
Utilities expense	12,500	6.7	9,000	6.0	
Supplies expense	2,700	1.4	3,000	2.0	
Miscellaneous expense	2,300	1.2	1,800	1.2	
Total operating expenses	\$ 92,500	49.3%	\$ 70,800	47.2 %	
Net income	\$ 95,000	50.7%	\$ 79,200	52.8%	

^{*}Rounded to one decimal place

The preceding vertical analysis indicates both favorable and unfavorable trends affecting the income statement of J. Holmes, Attorney-at-Law. The increase in wages expense of 2% (32.0% - 30.0%) is an unfavorable trend, as is the increase in utilities expense of 0.7% (6.7% - 6.0%). A favorable trend is the decrease in supplies expense of 0.6% (2.0% - 1.4%). Rent expense and miscellaneous expense

as a percent of fees earned were constant. The net result of these trends is that net income decreased as a percent of fees earned from 52.8% to 50.7%.

The analysis of the various percentages shown for J. Holmes, Attorney-at-Law, can be enhanced by comparisons with industry averages. Such averages are published by trade associations and financial information services. Any major differences between industry averages should be investigated.

Vertical analysis of operating income taken from two recent years of income statements for Pandora Media, Inc. follows:

Pandora Media, Inc. Income Statements For the Years Ended January 31

	Year 2		Ye	ar 1
	Amount*	Percent**	Amount*	Percent**
Revenues:				
Advertising	\$239,957	87.5%	\$119,333	86.6%
Subscription services (other)	34,383	12.5	18,431	13.4
Total revenue	\$274,340	100.0%	\$137,764	100.0%
Expenses:				
Cost of revenues	22,759	8.3%	11,559	8.4%
Marketing and selling	65,010	23.7	36,250	26.3
General and administrative	35,428	12.9	14,183	10.3
Content acquisition	148,708	54.2	69,357	50.3
Product development	13,425	4.9	6,736	4.9
Total expenses	\$285,330	104.0 %	\$138,085	100.2%
Operating income (loss)	\$ (10,990)	(4.0)	\$ (321)	(0.2)%

^{*}In thousands

The preceding analysis illustrates the usefulness of vertical analysis. Since Year 2 revenues are almost twice those of Year 1, it is difficult to compare operating results using only dollar amounts. Vertical analysis, however, reveals that advertising revenue as a percent of total revenue in Year 2 increased 0.9% over that in Year 1, while subscription revenues fell by the same percent. In addition, expenses as a percent of total revenues increased 3.8% from Year 1 and to Year 2. Specifically, marketing and selling expenses declined from 26.3% to 23.7%, while general and administrative expenses increased from 10.3% to 12.9%. In addition, content acquisition costs, which include royalties paid to artists for playing their music, increased from 50.3% to 54.2%. As a result, the loss from operations increased from (0.2%) to (4.0%). There does not appear to be any major change in Pandora's overall operating performance from Year 1 to Year 2 except for increasing revenues and the related increase in expenses.

Example Exercise 3-10 Vertical Analysis



Two income statements for Fortson Company follow:

Fortson Company Income Statements For the Years Ended December 31, 2016 and 2015

	2016	2015
Fees earned	\$425,000	\$375,000
Operating expenses	263,500	210,000
Operating income	\$161,500	\$165,000

- a. Prepare a vertical analysis of Fortson Company's income statements.
- b. Does the vertical analysis indicate a favorable or an unfavorable trend?

(Continued)

^{**}Rounded to one decimal place

Follow My Example 3-10

a.

Fortson Company Income Statements For the Years Ended December 31, 2016 and 2015

	2016		20	15
	Amount Percent		Amount	Percent
Fees earned	\$425,000	100%	\$375,000	100%
Operating expenses	263,500	62	210,000	<u>56</u> 44%
Operating income	\$161,500	38%	\$165,000	44%

b. An unfavorable trend of increasing operating expenses and decreasing operating income is indicated.

.....

Practice Exercises: PE 3-10A, PE 3-10B

At a Glance 3



Describe the nature of the adjusting process.

Key Points The accrual basis of accounting requires that revenues are reported in the period in which they are earned and expenses are matched with the revenues they generate. The updating of accounts at the end of the accounting period is called the adjusting process. Each adjusting entry affects an income statement and balance sheet account. The four types of accounts requiring adjusting entries are prepaid expenses, unearned revenues, accrued revenues, and accrued expenses.

Learning Outcomes • Explain why accrual accounting requires adjusting entries.	Example Exercises	Practice Exercises
• List accounts that do and do NOT require adjusting entries at the end of the accounting period.	EE3-1	PE3-1A, 3-1B
• Give an example of a prepaid expense, unearned revenue, accrued revenue, and accrued expense.	EE3-2	PE3-2A, 3-2B



Journalize entries for accounts requiring adjustment.

Key Points At the end of the period, adjusting entries are needed for prepaid expenses, unearned revenues, accrued revenues, and accrued expenses. In addition, an adjusting entry is necessary to record depreciation on fixed assets.

Learning Outcomes	Example Exercises	Practice Exercises	
• Prepare an adjusting entry for a prepaid expense.	EE3-3	PE3-3A, 3-3B	
• Prepare an adjusting entry for an unearned revenue.	EE3-4	PE3-4A, 3-4B	
• Prepare an adjusting entry for an accrued revenue.	EE3-5	PE3-5A, 3-5B	
• Prepare an adjusting entry for an accrued expense.	EE3-6	PE3-6A, 3-6B	
• Prepare an adjusting entry for depreciation expense.	EE3-7	PE3-7A, 3-7B	



Summarize the adjustment process.

Key Points A summary of adjustments, including the type of adjustment, reason for the adjustment, the adjusting entry, and the effect of omitting an adjustment on the financial statements, is shown in Exhibit 8.

Learning Outcomes	Example Exercises	Practice Exercises
 Determine the effect on the income statement and balance sheet of omitting an adjusting entry for prepaid expense, unearned revenue, accrued revenue, accrued expense, and depreciation. 	EE3-8	PE3-8A, 3-8B



Prepare an adjusted trial balance.

Key Points After all the adjusting entries have been posted, the equality of the total debit balances and total credit balances is verified by an adjusted trial balance.

Learning Outcomes	Example Exercises	Practice Exercises
Prepare an adjusted trial balance.		
 Determine the effect of errors on the equality of the adjusted trial balance. 	EE3-9	PE3-9A, 3-9B



Describe and illustrate the use of vertical analysis in evaluating a company's performance and financial condition.

Key Points Comparing each item on a financial statement with a total amount from the same statement is called vertical analysis. On the balance sheet, each asset is expressed as a percent of total assets, and each liability and stockholders' equity is expressed as a percent of total liabilities and stockholders' equity. On the income statement, each revenue and expense is expressed as a percent of total revenues or fees earned.

Learning Outcomes	Example Exercises	Practice Exercises
Describe vertical analysis.		
• Prepare a vertical analysis report of a financial statement.	EE3-10	PE3-10A, 3-10B

Key Terms

accounting period concept (104) accrual basis of accounting (104) accrued expenses (108) accrued revenues (107) Accumulated Depreciation (117) adjusted trial balance (123) adjusting entries (105) adjusting process (105)

book value of the asset
(or net book value) (118)
cash basis of accounting (104)
contra accounts (or contra
asset accounts) (117)
depreciate (117)
depreciation (117)
depreciation expense (117)

fixed assets (or plant assets) (117) matching concept (or matching principle) (104) prepaid expenses (105) revenue recognition concept (104) unearned revenues (106) vertical analysis (124)

Illustrative Problem

Three years ago, T. Roderick organized Harbor Realty. At July 31, 2016, the end of the current year, the unadjusted trial balance of Harbor Realty follows:

Harbor Realty Unadjusted Trial Balance July 31, 2016				
	Debit Balances	Credit Balances		
Cash	3,425			
Accounts Receivable	7,000			
Supplies	1,270			
Prepaid Insurance	620			
Office Equipment	51,650			
Accumulated Depreciation—Office Equipment		9,700		
Accounts Payable		925		
Wages Payable		0		
Unearned Fees		1,250		
Common Stock		5,000		
Retained Earnings		24,000		
Dividends	5,200			
Fees Earned		59,125		
Wages Expense	22,415			
Depreciation Expense	0			
Rent Expense	4,200			
Utilities Expense	2,715			
Supplies Expense	0			
Insurance Expense	0			
Miscellaneous Expense	1,505			
	100,000	100,000		

The data needed to determine year-end adjustments are as follows:

- a. Supplies on hand at July 31, 2016, \$380.
- b. Insurance premiums expired during the year, \$315.
- c. Depreciation of equipment during the year, \$4,950.
- d. Wages accrued but not paid at July 31, 2016, \$440.
- e. Accrued fees earned but not recorded at July 31, 2016, \$1,000.
- f. Unearned fees on July 31, 2016, \$750.

Instructions

- 1. Prepare the necessary adjusting journal entries. Include journal entry explanations.
- 2. Determine the balance of the accounts affected by the adjusting entries, and prepare an adjusted trial balance.

Solution

1.

Journal						
Date	2	Description	Post. Ref.	Debit	Credit	
July	31	Supplies Expense Supplies Supplies used (\$1,270 – \$380).		890	890	
	31	Insurance Expense Prepaid Insurance Insurance expired.		315	315	
	31	Depreciation Expense Accumulated Depreciation—Office Equipment Depreciation expense.		4,950	4,950	
	31	Wages Expense Wages Payable Accrued wages.		440	440	
	31	Accounts Receivable Fees Earned Accrued fees.		1,000	1,000	
	31	Unearned Fees Fees Earned Fees earned (\$1,250 – \$750).		500	500	

2.

Harbor Realty Adjusted Trial Balance July 31, 2016		
	Debit Balances	Credit Balances
Cash	3,425	
Accounts Receivable	8,000	
Supplies	380	
Prepaid Insurance	305	
Office Equipment	51,650	
Accumulated Depreciation—Office Equipment		14,650
Accounts Payable		925
Wages Payable		440
Unearned Fees		750
Common Stock		5,000
Retained Earnings		24,000
Dividends	5,200	
Fees Earned		60,625
Wages Expense	22,855	
Depreciation Expense	4,950	
Rent Expense	4,200	
Utilities Expense	2,715	
Supplies Expense	890	
Insurance Expense	315	
Miscellaneous Expense	1,505	
	106,390	106,390

Discussion Questions

- 1. How are revenues and expenses reported on the income statement under (a) the cash basis of accounting and (b) the accrual basis of accounting?
- 2. Is the matching concept related to (a) the cash basis of accounting or (b) the accrual basis of accounting?
- 3. Why are adjusting entries needed at the end of an accounting period?
- 4. What is the difference between *adjusting entries* and *correcting entries*?
- Identify the four different categories of adjusting entries frequently required at the end of an accounting period.
- 6. If the effect of the debit portion of an adjusting entry is to increase the balance of an asset account, which of the following statements describes the effect of the credit portion of the entry?
 - a. Increases the balance of a revenue account.
 - b. Increases the balance of an expense account.
 - c. Increases the balance of a liability account.

- 7. If the effect of the credit portion of an adjusting entry is to increase the balance of a liability account, which of the following statements describes the effect of the debit portion of the entry?
 - a. Increases the balance of a revenue account.
 - b. Increases the balance of an expense account.
 - c. Increases the balance of an asset account.
- 8. Does every adjusting entry have an effect on determining the amount of net income for a period? Explain.
- 9. On November 1 of the current year, a business paid the November rent on the building that it occupies. (a) Do the rights acquired at November 1 represent an asset or an expense? (b) What is the justification for debiting Rent Expense at the time of payment?
- 10. (a) Explain the purpose of the two accounts: Depreciation Expense and Accumulated Depreciation.(b) What is the normal balance of each account?(c) Is it customary for the balances of the two accounts to be equal in amount? (d) In what financial statements, if any, will each account appear?

Practice Exercises

SHOW

ME HOW

ME HOW

SHOW

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SHOW

ME HOW

EE 3-1 p. 105

PE 3-1A Accounts requiring adjustment

OBJ. 1

Indicate with a Yes or No whether or not each of the following accounts normally requires an adjusting entry:

- a. Accumulated Depreciation
- c. Land
- e. Supplies

b. Dividends

- d. Salaries Payable
- f. Unearned Rent

EE 3-1 *p. 105*

PE 3-1B Accounts requiring adjustment

OBJ, 1

Indicate with a Yes or No whether or not each of the following accounts normally requires an adjusting entry:

- a. Building
- c. Interest Expense
- e. Common Stock

b. Cash

- d. Miscellaneous Expense
- f. Prepaid Insurance

EE 3-2 p. 109

PE 3-2A Type of adjustment

OBJ. 1

Classify the following items as (1) prepaid expense, (2) unearned revenue, (3) accrued revenue, or (4) accrued expense:

- a. Cash received for services not yet rendered
- c. Rent revenue earned but not received
- b. Insurance paid for the next year
- d. Salaries owed but not yet paid



PE 3-2B Type of adjustment

OBJ. 1

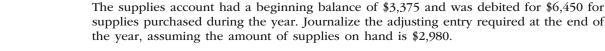
Classify the following items as (1) prepaid expense, (2) unearned revenue, (3) accrued revenue, or (4) accrued expense:

- a. Cash received for use of land next month
- c. Rent expense owed but not yet paid
- b. Fees earned but not received
- d. Supplies on hand



PE 3-3A Adjustment for prepaid expense

OBJ. 2





EE 3-3 p. 112 PE 3-3B Adjustment for prepaid expense

OBJ. 2

The prepaid insurance account had a beginning balance of \$9,600 and was debited for \$12,900 of premiums paid during the year. Journalize the adjusting entry required at the end of the year, assuming the amount of unexpired insurance related to future periods is \$7,360.



EE 3-4 *p. 113* **PE 3-4A** Adjustment for unearned revenue

OBJ. 2

The balance in the unearned fees account, before adjustment at the end of the year, is \$272,500. Journalize the adjusting entry required, assuming the amount of unearned fees at the end of the year is \$189,750.



EE 3-4 p. 113 **PE 3-4B** Adjustment for unearned revenue

OBJ. 2

On June 1, 2016, Herbal Co. received \$18,900 for the rent of land for 12 months. Journalize the adjusting entry required for unearned rent on December 31, 2016.



SHOW ME HOW

EE 3-5 p. 115 PE 3-5A Adjustment for accrued revenues

OBJ. 2



ME HOW

PE 3-5B Adjustment for accrued revenues **EE 3-5** p. 115

OBJ. 2



ME HOW

PE 3-6A Adjustment for accrued expense **EE 3-6** p. 116

OBJ. 2



We-Sell Realty Co. pays weekly salaries of \$11,800 on Friday for a five-day workweek ending on that day. Journalize the necessary adjusting entry at the end of the accounting period, assuming that the period ends on Wednesday.

At the end of the current year, \$23,570 of fees have been earned but have not been billed

At the end of the current year, \$17,555 of fees have been earned but have not been billed

to clients. Journalize the adjusting entry to record the accrued fees.

to clients. Journalize the adjusting entry to record the accrued fees.

PE 3-6B Adjustment for accrued expense **EE 3-6** p. 116

OBJ. 2



Prospect Realty Co. pays weekly salaries of \$27,600 on Monday for a six-day workweek ending the preceding Saturday. Journalize the necessary adjusting entry at the end of the accounting period, assuming that the period ends on Friday.

PE 3-7A Adjustment for depreciation **EE 3-7** *p.* 118

OBJ. 2



The estimated amount of depreciation on equipment for the current year is \$6,880. Journalize the adjusting entry to record the depreciation.

EE 3-7 *p.* 118 PE 3-7B Adjustment for depreciation

OBJ. 2



The estimated amount of depreciation on equipment for the current year is \$7,700. Journalize the adjusting entry to record the depreciation.

EE 3-8 p. 123

PE 3-8A Effect of omitting adjustments

OBJ. 3



For the year ending August 31, 2016, Mammalia Medical Co. mistakenly omitted adjusting entries for (1) depreciation of \$5,800, (2) fees earned that were not billed of \$44,500, and (3) accrued wages of \$7,300. Indicate the combined effect of the errors on (a) revenues, (b) expenses, and (c) net income for the year ended August 31, 2016.

EE 3-8 *p. 123*

PE 3-8B Effect of omitting adjustments

OBJ. 3



For the year ending April 30, 2016, Urology Medical Services Co. mistakenly omitted adjusting entries for (1) \$1,400 of supplies that were used, (2) unearned revenue of \$6,600 that was earned, and (3) insurance of \$9,000 that expired. Indicate the combined effect of the errors on (a) revenues, (b) expenses, and (c) net income for the year ended April 30, 2016.

EE 3-9 p. 124

PE 3-9A Effect of errors on adjusted trial balance

OBJ. 4



For each of the following errors, considered individually, indicate whether the error would cause the adjusted trial balance totals to be unequal. If the error would cause the adjusted trial balance totals to be unequal, indicate whether the debit or credit total is higher and by how much.

- The adjustment of \$9,800 for accrued fees earned was journalized as a debit to Accounts Receivable for \$9,800 and a credit to Fees Earned for \$8,900.
- b. The adjustment of depreciation of \$3,600 was omitted from the end-of-period adjusting entries.

EE 3-9 *p. 124*

PE 3-9B Effect of errors on adjusted trial balance

OBJ. 4



For each of the following errors, considered individually, indicate whether the error would cause the adjusted trial balance totals to be unequal. If the error would cause the adjusted trial balance totals to be unequal, indicate whether the debit or credit total is higher and by how much.

- a. The adjustment for accrued wages of \$5,200 was journalized as a debit to Wages Expense for \$5,200 and a credit to Accounts Payable for \$5,200.
- b. The entry for \$1,125 of supplies used during the period was journalized as a debit to Supplies Expense of \$1,125 and a credit to Supplies of \$1,152.

EE 3-10 *p. 125*

PE 3-10A Vertical analysis

OBJ. 5



ME HOW

Two income statements for Hemlock Company follow:

Hemlock Company Income Statements For Years Ended December 31

2016	2015
\$725,000	\$615,000
435,000	356,700
\$290,000	\$258,300
	\$725,000 435,000

- a. Prepare a vertical analysis of Hemlock Company's income statements.
- b. Does the vertical analysis indicate a favorable or an unfavorable trend?

EE 3-10 *p. 125*

PE 3-10B Vertical analysis

OBJ. 5





Two income statements for Cornea Company follow:

Cornea Company Income Statements For Years Ended December 31

	2016	2015
Fees earned	\$1,640,000	\$1,300,000
Operating expenses	869,200	715,000
Operating income	\$ 770,800	\$ 585,000

- a. Prepare a vertical analysis of Cornea Company's income statements.
- b. Does the vertical analysis indicate a favorable or an unfavorable trend?

Exercises

EX 3-1 Classifying types of adjustments

OBJ. 1

Classify the following items as (a) prepaid expense, (b) unearned revenue, (c) accrued revenue, or (d) accrued expense:

- 1. A two-year premium paid on a fire insurance policy.
- 2. Fees earned but not yet received.
- 3. Fees received but not yet earned.
- 4. Salary owed but not yet paid.
- 5. Subscriptions received in advance by a magazine publisher.
- 6. Supplies on hand.
- 7. Taxes owed but payable in the following period.
- 8. Utilities owed but not yet paid.

EX 3-2 Classifying adjusting entries

OBJ. 1

The following accounts were taken from the unadjusted trial balance of Orion Co., a congressional lobbying firm. Indicate whether or not each account would normally require an adjusting entry. If the account normally requires an adjusting entry, use the following notation to indicate the type of adjustment:

AE—Accrued Expense AR—Accrued Revenue PE—Prepaid Expense UR—Unearned Revenue

To illustrate, the answer for the first account follows:

Account	Answer
Accounts Receivable	Normally requires adjustment (AR).
Cash	
Common Stock	
Interest Expense	
Interest Receivable	
Land	
Office Equipment	
Prepaid Rent	
Supplies	
Unearned Fees	
Wages Expense	

EX 3-3 Adjusting entry for supplies

OBJ. 2

The balance in the supplies account, before adjustment at the end of the year, is \$5,330. Journalize the adjusting entry required if the amount of supplies on hand at the end of the year is \$1,875.

EX 3-4 Determining supplies purchased

OBJ. 2

The supplies and supplies expense accounts at December 31, after adjusting entries have been posted at the end of the first year of operations, are shown in the following T accounts:

	Supp	olies		Supplies Expe	nse
Bal.	2,550		Bal.	7,120	

Determine the amount of supplies purchased during the year.

EX 3-5 Effect of omitting adjusting entry

OBJ. 2. 3

At March 31, the end of the first month of operations, the usual adjusting entry transferring prepaid insurance expired to an expense account is omitted. Which items will be incorrectly stated, because of the error, on (a) the income statement for March and (b) the balance sheet as of March 31? Also indicate whether the items in error will be overstated or understated.

EX 3-6 Adjusting entries for prepaid insurance

OBJ. 2

The balance in the prepaid insurance account, before adjustment at the end of the year, is \$18,630. Journalize the adjusting entry required under each of the following *alternatives* for determining the amount of the adjustment: (a) the amount of insurance expired during the year is \$15,300; (b) the amount of unexpired insurance applicable to future periods is \$3,330.











ME HOW









EX 3-7 Adjusting entries for prepaid insurance

OBJ. 2

The prepaid insurance account had a balance of \$7,000 at the beginning of the year. The account was debited for \$24,000 for premiums on policies purchased during the year. Journalize the adjusting entry required under each of the following *alternatives* for determining the amount of the adjustment: (a) the amount of unexpired insurance applicable to future periods is \$8,500; (b) the amount of insurance expired during the year is \$22,500.

EX 3-8 Adjusting entries for unearned fees

OBJ. 2

The balance in the unearned fees account, before adjustment at the end of the year, is \$36,950. Journalize the adjusting entry required if the amount of unearned fees at the end of the year is \$14,440.

EX 3-9 Effect of omitting adjusting entry

OBJ. 2, 3

At the end of July, the first month of the business year, the usual adjusting entry transferring rent earned to a revenue account from the unearned rent account was omitted. Indicate which items will be incorrectly stated, because of the error, on (a) the income statement for July and (b) the balance sheet as of July 31. Also indicate whether the items in error will be overstated or understated.

EX 3-10 Adjusting entry for accrued fees

OBJ. 2

At the end of the current year, \$22,650 of fees have been earned but have not been billed to clients.

- a. Journalize the adjusting entry to record the accrued fees.
- b. If the cash basis rather than the accrual basis had been used, would an adjusting entry have been necessary? Explain.

EX 3-11 Adjusting entries for unearned and accrued fees

OBJ. 2

The balance in the unearned fees account, before adjustment at the end of the year, is \$97,770. Of these fees, \$82,220 have been earned. In addition, \$34,250 of fees have been earned but have not been billed. Journalize the adjusting entries (a) to adjust the unearned fees account and (b) to record the accrued fees.

EX 3-12 Effect of omitting adjusting entry

OBJ. 2. 3

The adjusting entry for accrued fees was omitted at October 31, the end of the current year. Indicate which items will be in error, because of the omission, on (a) the income statement for the current year and (b) the balance sheet as of October 31. Also indicate whether the items in error will be overstated or understated.

EX 3-13 Adjusting entries for accrued salaries

OBJ. 2

Ocular Realty Co. pays weekly salaries of \$16,600 on Friday for a five-day workweek ending on that day. Journalize the necessary adjusting entry at the end of the accounting period, assuming that the period ends (a) on Wednesday and (b) on Thursday.

EX 3-14 Determining wages paid

OBJ. 2

The wages payable and wages expense accounts at May 31, after adjusting entries have been posted at the end of the first month of operations, are shown in the following T accounts:

Wages Payable		Wages Expense		
Bal.	7,175	Bal.	73,250	

Determine the amount of wages paid during the month.

EX 3-15 Effect of omitting adjusting entry

OBJ. 2, 3

Accrued salaries owed to employees for October 30 and 31 are not considered in preparing the financial statements for the year ended October 31. Indicate which items will be erroneously stated, because of the error, on (a) the income statement for the year and (b) the balance sheet as of October 31. Also indicate whether the items in error will be overstated or understated.

EX 3-16 Effect of omitting adjusting entry

OBJ. 2, 3

Assume that the error in Exercise 3-15 was not corrected and that the accrued salaries were included in the first salary payment in November. Indicate which items will be erroneously stated, because of failure to correct the initial error, on (a) the income statement for the month of November and (b) the balance sheet as of November 30.

EX 3-17 Adjusting entries for prepaid and accrued taxes

OBJ. 2

Art Imaging Company was organized on April 1 of the current year. On April 2, Art Imaging Company prepaid \$54,000 to the city for taxes (license fees) for the *next* 12 months and debited the prepaid taxes account. Art Imaging Company is also required to pay in January an annual tax (on property) for the *previous* calendar year. The estimated amount of the property tax for the current year (April 1 to December 31) is \$26,500.

- a. Journalize the two adjusting entries required to bring the accounts affected by the two taxes up to date as of December 31, the end of the current year.
- b. What is the amount of tax expense for the current year?

EX 3-18 Adjustment for depreciation

OBJ. 2

The estimated amount of depreciation on equipment for the current year is \$10,650. Journalize the adjusting entry to record the depreciation.

EX 3-19 Determining fixed asset's book value

OBJ. 2

The balance in the equipment account is \$28,650,000, and the balance in the accumulated depreciation—equipment account is \$16,430,000.

- a. What is the book value of the equipment?
- b. Does the balance in the accumulated depreciation account mean that the equipment's loss of value is \$16,430,000? Explain.

EX 3-20 Book value of fixed assets

OBJ. 2

In a recent balance sheet, Microsoft Corporation reported *Property, Plant, and Equipment* of \$19,231 million and *Accumulated Depreciation* of \$10,962 million.

- a. What was the book value of the fixed assets?
- b. Would the book value of Microsoft Corporation's fixed assets normally approximate their fair market values?

EX 3-21 Effects of errors on financial statements

OBJ. 2, 3

For a recent period, the balance sheet for Costco Wholesale Corporation reported accrued expenses of \$2,890 million. For the same period, Costco reported income before income taxes of \$2,767 million. Assume that the adjusting entry for \$2,890 million of accrued expenses was not recorded at the end of the current period. What would have been the income (loss) before income taxes?

✓ b. \$67,000













EX 3-22 Effects of errors on financial statements

OBJ. 2, 3

For a recent year, the balance sheet for The Campbell Soup Company includes accrued expenses of \$598 million. The income before taxes for The Campbell Soup Company for the year was \$1,106 million.

- a. Assume the adjusting entry for \$598 million of accrued expenses was not recorded at the end of the year. By how much would income before taxes have been misstated?
- b. What is the percentage of the misstatement in (a) to the reported income of \$1,106 million? Round to one decimal place.

EX 3-23 Effects of errors on financial statements

OBJ. 2, 3

✓ 1. a. Revenue understated, \$34,900

The accountant for Healthy Life Company, a medical services consulting firm, mistakenly omitted adjusting entries for (a) unearned revenue earned during the year (\$34,900) and (b) accrued wages (\$12,770). Indicate the effect of each error, considered individually, on the income statement for the current year ended July 31. Also indicate the effect of each error on the July 31 balance sheet. Set up a table similar to the following, and record your answers by inserting the dollar amount in the appropriate spaces. Insert a zero if the error does not affect the item.

	Error (a)		Erro	r (b)
	Over- stated	Under- stated	Over- stated	Under- stated
1. Revenue for the year would be	\$	\$	\$	\$
2. Expenses for the year would be	\$	\$	\$	\$
3. Net income for the year would be	\$	\$	\$	\$
4. Assets at July 31 would be	\$	\$	\$	\$
5. Liabilities at July 31 would be	\$	\$	\$	\$
6. Stockholders' equity at July 31 would be	\$	\$	\$	\$

EX 3-24 Effects of errors on financial statements

OBJ. 2, 3

If the net income for the current year had been \$196,400 in Exercise 3-23, what would have been the correct net income if the proper adjusting entries had been made?

EX 3-25 Adjusting entries for depreciation; effect of error

OBJ. 2, 3

On December 31, a business estimates depreciation on equipment used during the first year of operations to be \$13,900.

- a. Journalize the adjusting entry required as of December 31.
- b. If the adjusting entry in (a) were omitted, which items would be erroneously stated on (1) the income statement for the year and (2) the balance sheet as of December 31?

EX 3-26 Adjusting entries from trial balances

OBJ. 4

The unadjusted and adjusted trial balances for American Leaf Company on October 31, 2016, follow:





American Leaf Company Trial Balances October 31, 2016

	Unadj	usted	Adjusted	
	Debit Balances	Credit Balances	Debit Balances	Credit Balances
Cash	16		16	
Accounts Receivable	38		44	
Supplies	12		10	
Prepaid Insurance	20		8	
Land	26		26	
Equipment	40		40	
Accumulated Depreciation—Equipment		8		12
Accounts Payable		26		26
Wages Payable		0		2
Common Stock		20		20
Retained Earnings		72		72
Dividends	8		8	
Fees Earned		74		80
Wages Expense	24		26	
Rent Expense	8		8	
Insurance Expense	0		12	
Utilities Expense	4		4	
Depreciation Expense	0		4	
Supplies Expense	0		2	
Miscellaneous Expense	4		4	
•	200	200	212	212

Journalize the five entries that adjusted the accounts at October 31, 2016. None of the accounts were affected by more than one adjusting entry.

EX 3-27 Adjusting entries from trial balances

OBJ. 4

The accountant for Eva's Laundry prepared the following unadjusted and adjusted trial balances. Assume that all balances in the unadjusted trial balance and the amounts of the adjustments are correct. Identify the errors in the accountant's adjusting entries, assuming that none of the accounts were affected by more than one adjusting entry.

Eva's Laundry Trial Balances May 31, 2016

	Unadjusted		Adju	sted
	Debit Balances	Credit Balances	Debit Balances	Credit Balances
Cash	7,500		7,500	
Accounts Receivable	18,250		23,250	
Laundry Supplies	3,750		6,750	
Prepaid Insurance*	5,200		1,600	
Laundry Equipment	190,000		177,000	
Accumulated Depreciation—Laundry Equipment		48,000		48,000
Accounts Payable		9,600		9,600
Wages Payable				1,000
Common Stock		35,000		35,000
Retained Earnings		75,300		75,300
Dividends	28,775		28,775	
Laundry Revenue		182,100		182,100
Wages Expense	49,200		49,200	
Rent Expense	25,575		25,575	
Utilities Expense	18,500		18,500	
Depreciation Expense			13,000	
Laundry Supplies Expense			3,000	
Insurance Expense			600	
Miscellaneous Expense	3,250		3,250	
	350,000	350,000	358,000	351,000

^{*\$3,600} of insurance expired during the year.

✓ Corrected trial balance totals, \$369,000

EX 3-28 Vertical analysis of income statement

OBJ. 5





The following data (in millions) are taken from recent financial statements of Nike Inc.:

	Year 2	Year 1
Sales (revenues)	\$24,128	\$20,862
Net income	2,223	2,133

- a. Determine the amount of change (in millions) and percent of change in net income for Year 2. Round to one decimal place.
- b. Determine the percentage relationship between net income and sales (net income divided by sales) for Year 2 and Year 1. Round to one decimal place.
- c. What conclusions can you draw from your analysis?

EX 3-29 Vertical analysis of income statement

OBJ. 5





The following income statement data (in millions) for Dell Inc. and Hewlett-Packard Company (HP) were taken from their recent annual reports:

	Dell	Hewlett-Packard
Sales	\$62,071	\$120,357
Cost of goods sold (expense)	(48,260)	(92,385)
Operating expenses	(9,380)	_(39,029)
Operating income (loss)	\$ 4,431	\$ (11,057)

- a. Prepare a vertical analysis of the income statement for Dell. Round to one decimal place.
- b. Prepare a vertical analysis of the income statement for HP. Round to one decimal place.
- c. Based on (a) and (b), how does Dell compare to HP?

Problems: Series A





PR 3-1A Adjusting entries

OBJ. 2

On March 31, 2016, the following data were accumulated to assist the accountant in preparing the adjusting entries for Potomac Realty:

- a. The supplies account balance on March 31 is \$5,620 The supplies on hand on March 31 are \$1,290.
- b. The unearned rent account balance on March 31 is \$5,000 representing the receipt of an advance payment on March 1 of four months' rent from tenants.
- c. Wages accrued but not paid at March 31 are \$2,290.
- d. Fees accrued but unbilled at March 31 are \$16,825.
- e. Depreciation of office equipment is \$4,600.

Instructions

- 1. Journalize the adjusting entries required at March 31, 2016.
- 2. Briefly explain the difference between adjusting entries and entries that would be made to correct errors.

PR 3-2A Adjusting entries

OBJ. 2, 3

Selected account balances before adjustment for Alantic Coast Realty at July 31, 2016, the end of the current year, are as follows:

(Continued)



	Debits	Credits
Accounts Receivable	\$ 75,000	
Equipment	345,700	
Accumulated Depreciation—Equipment		\$112,500
Prepaid Rent	9,000	
Supplies	3,350	
Wages Payable		_
Unearned Fees		12,000
Fees Earned		660,000
Wages Expense	325,000	
Rent Expense	_	
Depreciation Expense	_	
Supplies Expense	_	

Data needed for year-end adjustments are as follows:

- a. Unbilled fees at July 31, \$11,150.
- b. Supplies on hand at July 31, \$900.
- c. Rent expired, \$6,000.
- d. Depreciation of equipment during year, \$8,950.
- e. Unearned fees at July 31, \$2,000.
- f. Wages accrued but not paid at July 31, \$4,840.

Instructions

- 1. Journalize the six adjusting entries required at July 31, based on the data presented.
- 2. What would be the effect on the income statement if adjustments (a) and (f) were omitted at the end of the year?
- 3. What would be the effect on the balance sheet if adjustments (a) and (f) were omitted at the end of the year?
- 4. What would be the effect on the "Net increase or decrease in cash" on the statement of cash flows if adjustments (a) and (f) were omitted at the end of the year?

PR 3-3A Adjusting entries

OBJ. 2, 3

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Reliable Repairs & Service, an electronics repair store, prepared the following unadjusted trial balance at the end of its first year of operations:

Reliable Repairs & Service Unadjusted Trial Balance April 30, 2016

	Debit	Credit
	Balances	Balances
Cash	10,350	
Accounts Receivable	67,500	
Supplies	16,200	
Equipment	116,100	
Accounts Payable		15,750
Unearned Fees		18,000
Common Stock		10,000
Retained Earnings		111,500
Dividends	13,500	
Fees Earned		294,750
Wages Expense	94,500	
Rent Expense	72,000	
Utilities Expense	51,750	
Miscellaneous Expense	8,100	
	450,000	450,000

General Ledger

For preparing the adjusting entries, the following data were assembled:

- a. Fees earned but unbilled on April 30 were \$9,850.
- b. Supplies on hand on April 30 were \$4,660.
- c. Depreciation of equipment was estimated to be \$6,470 for the year.
- d. The balance in unearned fees represented the April 1 receipt in advance for services to be provided. During April, \$15,000 of the services were provided.
- e. Unpaid wages accrued on April 30 were \$5,200.

Instructions

- 1. Journalize the adjusting entries necessary on April 30, 2016.
- 2. Determine the revenues, expenses, and net income of Reliable Service & Repairs before the adjusting entries.
- Determine the revenues, expense, and net income of Reliable Service & Repairs after the adjusting entries.
- 4. Determine the effect of the adjusting entries on Retained Earnings.

PR 3-4A Adjusting entries

OBJ. 2, 3, 4

Good Note Company specializes in the repair of music equipment and is owned and operated by Robin Stahl. On November 30, 2016, the end of the current year, the accountant for Good Note Company prepared the following trial balances:

Good Note Company Trial Balances November 30, 2016

·	Unadj	usted	Adjus	sted
	Debit Balances	Credit Balances	Debit Balances	Credit Balances
Cash	38,250		38,250	
Accounts Receivable	89,500		89,500	
Supplies	11,250		2,400	
Prepaid Insurance	14,250		3,850	
Equipment	290,450		290,450	
Accumulated Depreciation—Equipment		94,500		106,100
Automobiles	129,500		129,500	
Accumulated Depreciation—Automobiles		54,750		62,050
Accounts Payable		24,930		26,130
Salaries Payable		_		8,100
Unearned Service Fees		18,000		9,000
Common Stock		100,000		100,000
Retained Earnings		224,020		224,020
Dividends	75,000		75,000	
Service Fees Earned		733,800		742,800
Salary Expense	516,900		525,000	
Rent Expense	54,000		54,000	
Supplies Expense	_		8,850	
Depreciation Expense—Equipment	_		11,600	
Depreciation Expense—Automobiles			7,300	
Utilities Expense	12,900		14,100	
Taxes Expense	8,175		8,175	
Insurance Expense	_		10,400	
Miscellaneous Expense	9,825		9,825	
•	1,250,000	1,250,000	1,278,200	1,278,200

Instructions

Journalize the seven entries that adjusted the accounts at November 30. None of the accounts were affected by more than one adjusting entry.

General Ledger

✓ 2. Total of Debit column: \$776,180



General Ledger

PR 3-5A Adjusting entries and adjusted trial balances

OBJ. 2, 3, 4

Rowland Company is a small editorial services company owned and operated by Marlene Rowland. On August 31, 2016, the end of the current year, Rowland Company's accounting clerk prepared the following unadjusted trial balance:

Rowland Company Unadjusted Trial Balance August 31, 2016

	Debit Balances	Credit Balances
Cash	7,500	
Accounts Receivable	38,400	
Prepaid Insurance	7,200	
Supplies	1,980	
Land	112,500	
Building	150,250	
Accumulated Depreciation—Building		87,550
Equipment	135,300	,
Accumulated Depreciation—Equipment	•	97,950
Accounts Payable		12,150
Unearned Rent		6,750
Common Stock		75,000
Retained Earnings		146,000
Dividends	15,000	,
Fees Earned	,	324,600
Salaries and Wages Expense	193,370	',
Utilities Expense	42,375	
Advertising Expense	22,800	
Repairs Expense	17,250	
Miscellaneous Expense	6,075	
miscellulicous Experise	750,000	750,000

The data needed to determine year-end adjustments are as follows:

- a. Unexpired insurance at August 31, \$6,000.
- b. Supplies on hand at August 31, \$480.
- c. Depreciation of building for the year, \$7,500.
- d. Depreciation of equipment for the year, \$4,150.
- e. Rent unearned at August 31, \$1,550.
- f. Accrued salaries and wages at August 31, \$3,200.
- g. Fees earned but unbilled on August 31, \$11,330.

Instructions

- 1. Journalize the adjusting entries using the following additional accounts: Salaries and Wages Payable; Rent Revenue; Insurance Expense; Depreciation Expense—Building; Depreciation Expense—Equipment; and Supplies Expense.
- 2. Determine the balances of the accounts affected by the adjusting entries, and prepare an adjusted trial balance.

PR 3-6A Adjusting entries and errors

OBJ. 2, 3

At the end of April, the first month of operations, the following selected data were taken from the financial statements of Shelby Crawford, an attorney:

Net income for April	\$120,000
Total assets at April 30	750,000
Total liabilities at April 30	300,000
Total stockholders' equity at April 30	450,000

In preparing the financial statements, adjustments for the following data were overlooked:

- a. Supplies used during April, \$2,750.
- b. Unbilled fees earned at April 30, \$23,700.
- c. Depreciation of equipment for April, \$1,800.
- d. Accrued wages at April 30, \$1,400.

✓ 2. Corrected net income: \$137,750



Instructions

- 1. Journalize the entries to record the omitted adjustments.
- 2. Determine the correct amount of net income for April and the total assets, liabilities, and stockholders' equity at April 30. In addition to indicating the corrected amounts, indicate the effect of each omitted adjustment by setting up and completing a columnar table similar to the following. Adjustment (a) is presented as an example.

	Net Income	Total : Assets	= Total + 1 Liabilities	Total Stockholders' Equity
Reported amounts	\$120,000	\$750,000	\$300,000	\$450,000
Corrections:				
Adjustment (a)	-2,750	-2,750	0	-2,750
Adjustment (b)				
Adjustment (c)				
Adjustment (d)				
Corrected amounts				

Problems: Series B

PR 3-1B Adjusting entries

OBJ. 2

On May 31, 2016, the following data were accumulated to assist the accountant in preparing the adjusting entries for Oceanside Realty:

- a. Fees accrued but unbilled at May 31 are \$19,750.
- b. The supplies account balance on May 31 is \$12,300. The supplies on hand at May 31 are \$4,150.
- c. Wages accrued but not paid at May 31 are \$2,700.
- d. The unearned rent account balance at May 31 is \$9,000, representing the receipt of an advance payment on May 1 of three months' rent from tenants.
- e. Depreciation of office equipment is \$3,200.

Instructions

- 1. Journalize the adjusting entries required at May 31, 2016.
- 2. Briefly explain the difference between adjusting entries and entries that would be made to correct errors.

PR 3-2B Adjusting entries

OBJ. 2, 3

Selected account balances before adjustment for Intuit Realty at November 30, the end of the current year, follow:

	Debits	Credits
Accounts Receivable	\$ 75,000	
Equipment	250,000	
Accumulated Depreciation—Equipment		\$ 12,000
Prepaid Rent	12,000	
Supplies	3,170	
Wages Payable		_
Unearned Fees		10,000
Fees Earned		400,000
Wages Expense	140,000	
Rent Expense	_	
Depreciation Expense	_	
Supplies Expense	_	

Data needed for year-end adjustments are as follows:

- a. Supplies on hand at November 30, \$550.
- b. Depreciation of equipment during year, \$1,675.

(Continued)







- c. Rent expired during year, \$8,500.
- d. Wages accrued but not paid at November 30, \$2,000.
- e. Unearned fees at November 30, \$4,000.
- f. Unbilled fees at November 30, \$5,380.

Instructions

- 1. Journalize the six adjusting entries required at November 30, based on the data presented.
- 2. What would be the effect on the income statement if adjustments (b) and (e) were omitted at the end of the year?
- 3. What would be the effect on the balance sheet if adjustments (b) and (e) were omitted at the end of the year?
- 4. What would be the effect on the "Net increase or decrease in cash" on the statement of cash flows if adjustments (b) and (e) were omitted at the end of the year?

PR 3-3B Adjusting entries

OBJ. 2, 3

Crazy Mountain Outfitters Co., an outfitter store for fishing treks, prepared the following unadjusted trial balance at the end of its first year of operations:

Crazy Mountain Outfitters Co. Unadjusted Trial Balance April 30, 2016

	Debit Balances	Credit Balances
Cash	11,400	
Accounts Receivable	72,600	
Supplies	7,200	
Equipment	112,000	
Accounts Payable		12,200
Unearned Fees		19,200
Common Stock		20,000
Retained Earnings		117,800
Dividends	10,000	
Fees Earned		305,800
Wages Expense	157,800	
Rent Expense	55,000	
Utilities Expense	42,000	
Miscellaneous Expense	7,000	
	475,000	475,000

For preparing the adjusting entries, the following data were assembled:

- a. Supplies on hand on April 30 were \$1,380.
- b. Fees earned but unbilled on April 30 were \$3,900.
- c. Depreciation of equipment was estimated to be \$3,000 for the year.
- d. Unpaid wages accrued on April 30 were \$2,475.
- e. The balance in unearned fees represented the April 1 receipt in advance for services to be provided. Only \$14,140 of the services was provided between April 1 and April 30.

Instructions

- 1. Journalize the adjusting entries necessary on April 30, 2016.
- 2. Determine the revenues, expenses, and net income of Crazy Mountain Outfitters Co. before the adjusting entries.
- 3. Determine the revenues, expense, and net income of Crazy Mountain Outfitters Co. after the adjusting entries.
- 4. Determine the effect of the adjusting entries on Retained Earnings.

PR 3-4B Adjusting entries

OBJ. 2, 3, 4

The Signage Company specializes in the maintenance and repair of signs, such as billboards. On March 31, 2016, the accountant for The Signage Company prepared the following trial balances:

General Ledger

General Ledger

The Signage Company Trial Balances March 31, 2016

	Unadjusted		Adjusted	
	Debit Balances	Credit Balances	Debit Balances	Credit Balances
Cash	4,750		4,750	
Accounts Receivable	17,400		17,400	
Supplies	6,200		2,175	
Prepaid Insurance	9,000		1,150	
Land	100,000		100,000	
Buildings	170,000		170,000	
Accumulated Depreciation—Buildings		51,500		61,000
Trucks	75,000		75,000	
Accumulated Depreciation—Trucks		12,000		17,000
Accounts Payable		6,920		8,750
Salaries Payable		_		1,400
Unearned Service Fees		10,500		3,850
Common Stock		50,000		50,000
Retained Earnings		206,400		206,400
Dividends	7,500		7,500	
Service Fees Earned	-	162,680		169,330
Salary Expense	80,000		81,400	
Depreciation Expense—Trucks	_		5,000	
Rent Expense	11,900		11,900	
Supplies Expense	_		4,025	
Utilities Expense	6,200		8,030	
Depreciation Expense—Buildings	_		9,500	
Taxes Expense	2,900		2,900	
Insurance Expense	_		7,850	
Miscellaneous Expense	9,150		9,150	
·	500,000	500,000	517,730	517,730

Instructions

Journalize the seven entries that adjusted the accounts at March 31. None of the accounts were affected by more than one adjusting entry.

PR 3-5B Adjusting entries and adjusted trial balances

OBJ. 2, 3, 4

Reece Financial Services Co., which specializes in appliance repair services, is owned and operated by Joni Reece. Reece Financial Services Co.'s accounting clerk prepared the following unadjusted trial balance at July 31, 2016:

Reece Financial Services Co. Unadjusted Trial Balance July 31, 2016

	Debit Balances	Credit Balances
Cash	10,200	
Accounts Receivable	34,750	
Prepaid Insurance	6,000	
Supplies	1,725	
Land	50,000	
Building	155,750	
Accumulated Depreciation—Building		62,850
Equipment	45,000	
Accumulated Depreciation—Equipment	•	17,650
Accounts Payable		3,750
Unearned Rent		3,600
Common Stock		60,000
Retained Earnings		93,550
Dividends	8,000	93,330
	0,000	150 600
Fees Earned	56.050	158,600
Salaries and Wages Expense	56,850	
Utilities Expense	14,100	
Advertising Expense	7,500	
Repairs Expense	6,100	
Miscellaneous Expense	<u>4,025</u>	-
	400,000	400,000

(Continued)

✓ 2. Total of Debit column: \$420,300



General Ledger

✓ 2. Corrected net

income: \$128,700

The data needed to determine year-end adjustments are as follows:

- a. Depreciation of building for the year, \$6,400.
- b. Depreciation of equipment for the year, \$2,800.
- c. Accrued salaries and wages at July 31, \$900.
- d. Unexpired insurance at July 31, \$1,500.
- e. Fees earned but unbilled on July 31, \$10,200.
- f. Supplies on hand at July 31, \$615.
- g. Rent unearned at July 31, \$300.

Instructions

- 1. Journalize the adjusting entries using the following additional accounts: Salaries and Wages Payable; Rent Revenue; Insurance Expense; Depreciation Expense—Building; Depreciation Expense—Equipment; and Supplies Expense.
- 2. Determine the balances of the accounts affected by the adjusting entries and prepare an adjusted trial balance.

PR 3-6B Adjusting entries and errors

OBJ. 2, 3

At the end of August, the first month of operations, the following selected data were taken from the financial statements of Tucker Jacobs, an attorney:

Net income for August	\$112,500
Total assets at August 31	650,000
Total liabilities at August 31	225,000
Total stockholders' equity at August 31	425,000

In preparing the financial statements, adjustments for the following data were overlooked:

- a. Unbilled fees earned at August 31, \$31,900.
- b. Depreciation of equipment for August, \$7,500.
- c. Accrued wages at August 31, \$5,200.
- d. Supplies used during August, \$3,000.

Instructions

- 1. Journalize the entries to record the omitted adjustments.
- 2. Determine the correct amount of net income for August and the total assets, liabilities, and stockholders' equity at August 31. In addition to indicating the corrected amounts, indicate the effect of each omitted adjustment by setting up and completing a columnar table similar to the following. Adjustment (a) is presented as an example.

	Net Income	Total = Assets	Total + To Liabilities	otal Stockholders' Equity
Reported amounts	\$112,500	\$650,000	\$225,000	\$425,000
Corrections:				
Adjustment (a)	+31,900	+31,900	0	+31,900
Adjustment (b)				
Adjustment (c)				
Adjustment (d)				
Corrected amounts				

Continuing Problem

✓ 3. Total of Debit column: \$42,340

General Ledger

The unadjusted trial balance that you prepared for PS Music at the end of Chapter 2 should appear as follows:

PS Music Unadjusted Trial Balance July 31, 2016

	Debit Balances	Credit Balances
Cash	9,945	
Accounts Receivable	2,750	
Supplies	1,020	
Prepaid Insurance	2,700	
Office Equipment	7,500	
Accounts Payable		8,350
Unearned Revenue		7,200
Common Stock		9,000
Dividends	1,750	
Fees Earned		16,200
Music Expense	3,610	
Wages Expense	2,800	
Office Rent Expense	2,550	
Advertising Expense	1,500	
Equipment Rent Expense	1,375	
Utilities Expense	1,215	
Supplies Expense	180	
Miscellaneous Expense	1,855	
·	40,750	40,750

The data needed to determine adjustments are as follows:

- a. During July, PS Music provided guest disc jockeys for KXMD for a total of 115 hours. For information on the amount of the accrued revenue to be billed to KXMD, see the contract described in the July 3, 2016, transaction at the end of Chapter 2.
- b. Supplies on hand at July 31, \$275.
- c. The balance of the prepaid insurance account relates to the July 1, 2016, transaction at the end of Chapter 2.
- d. Depreciation of the office equipment is \$50.
- e. The balance of the unearned revenue account relates to the contract between PS Music and KXMD, described in the July 3, 2016, transaction at the end of Chapter 2.
- f. Accrued wages as of July 31, 2016, were \$140.

Instructions

- 1. Prepare adjusting journal entries. You will need the following additional accounts:
 - 18 Accumulated Depreciation—Office Equipment
 - 22 Wages Payable
 - 57 Insurance Expense
 - 58 Depreciation Expense
- 2. Post the adjusting entries, inserting balances in the accounts affected.
- 3. Prepare an adjusted trial balance.

Cases & Projects



CP 3-1 Ethics and professional conduct in business

Daryl Kirby opened Squid Realty Co. on January 1, 2015. At the end of the first year, the business needed additional capital. On behalf of Squid Realty Co., Daryl applied to Ocean National Bank for a loan of \$375,000. Based on Squid Realty Co.'s financial statements, which had been prepared on a cash basis, the Ocean National Bank loan officer rejected the loan as too risky.

(Continued)

After receiving the rejection notice, Daryl instructed his accountant to prepare the financial statements on an accrual basis. These statements included \$65,000 in accounts receivable and \$25,000 in accounts payable. Daryl then instructed his accountant to record an additional \$30,000 of accounts receivable for commissions on property for which a contract had been signed on December 28, 2015. The title to the property is to transfer on January 5, 2016, when an attorney formally records the transfer of the property to the buyer.

Daryl then applied for a \$375,000 loan from Free Spirit Bank, using the revised financial statements. On this application, Daryl indicated that he had not previously been rejected for credit.

Discuss the ethical and professional conduct of Daryl Kirby in applying for the loan from Free Spirit Bank.

CP 3-2 Accrued revenue

The following is an excerpt from a conversation between Sonia Lopez and Pete Lemke just before they boarded a flight to Paris on Delta Air Lines. They are going to Paris to attend their company's annual sales conference.

Sonia: Pete, aren't you taking an introductory accounting course at college?

Pete: Yes, I decided it's about time I learned something about accounting. You know, our annual bonuses are based on the sales figures that come from the accounting department.

Sonia: I guess I never really thought about it.

Pete: You should think about it! Last year, I placed a \$5,000,000 order on December 30. But when I got my bonus, the \$5,000,000 sale wasn't included. They said it hadn't been shipped until January 9, so it would have to count in next year's bonus.

Sonia: A real bummer!

Pete: Right! I was counting on that bonus including the \$5,000,000 sale.

Sonia: Did you complain?

Pete: Yes, but it didn't do any good. Julie, the head accountant, said something about matching revenues and expenses. Also, something about not recording revenues until the sale is final. I figure I'd take the accounting course and find out whether she's just messing with me.

 $\textit{Sonia:} \ In ever really thought about it. When do you think Delta \ Air Lines will record its revenues from this flight?$

Pete: Hmmm...I guess it could record the revenue when it sells the ticket...or...when the boarding passes are scanned at the door...or...when we get off the plane...or when our company pays for the tickets...or...I don't know. I'll ask my accounting instructor.

Discuss when Delta Air Lines should recognize the revenue from ticket sales to properly match revenues and expenses.

CP 3-3 Adjustments and financial statements

Several years ago, your brother opened Magna Appliance Repairs. He made a small initial investment and added money from his personal bank account as needed. He withdrew money for living expenses at irregular intervals. As the business grew, he hired an assistant. He is now considering adding more employees, purchasing additional service trucks, and purchasing the building he now rents. To secure funds for the expansion, your brother submitted a loan application to the bank and included the most recent financial statements (which follow) prepared from accounts maintained by a part-time bookkeeper.



Magna Appliance Repairs Income Statement For the Year Ended October 31, 2016

	\$675,000					
\$187,200						
148,500						
42,000						
39,000						
21,600						
54,600	492,900					
	\$ 182,100					
Magna Appliance Repairs Balance Sheet October 31, 2016						
Assets						
	\$ 95,400					
	112,500					
	332,100					
	\$540,000					
	100,000					
	440,000					
	\$540,000					
	148,500 42,000 39,000 21,600 54,600					

After reviewing the financial statements, the loan officer at the bank asked your brother if he used the accrual basis of accounting for revenues and expenses. Your brother responded that he did and that is why he included an account for "Amounts Due from Customers." The loan officer then asked whether or not the accounts were adjusted prior to the preparation of the statements. Your brother answered that they had not been adjusted.

- a. Why do you think the loan officer suspected that the accounts had not been adjusted prior to the preparation of the statements?
- b. Indicate possible accounts that might need to be adjusted before an accurate set of financial statements could be prepared.

CP 3-4 Codes of ethics

Group Project

Obtain a copy of your college or university's student code of conduct. In groups of three or four, answer the following questions:

- 1. Compare this code of conduct with the Institute of Management Accountants' *Statement of Ethical Professional Practice*, which can be obtained from the IMA Web site at www.imanet.org, and the American Institute of Certified Public Accountants' *Code of Professional Conduct*, which can be obtained from the AICPA Web site at www.aicpa.org.
- 2. One of your classmates asks you for permission to copy your homework, which your instructor will be collecting and grading for part of your overall term grade. Although your instructor has not stated whether one student may or may not copy another student's homework, is it ethical for you to allow your classmate to copy your homework?
 Is it ethical for your classmate to copy your homework?

Internet Project





Completing the Accounting Cycle

Zynga

Zynga is a leading provider of social games with more than 240 million active players per month. Zynga's games, such as CityVille, FarmVille, CastleVille, and Café World, can be played on a variety of platforms including Facebook, Google Android, and Apple iOS.

Zynga was founded in 2007 and is named after CEO (Chief Executive Officer) Mark Pincus's dog. Zinga is an American Bulldog who is known for her human-like qualities, which include sitting on chairs and eating at the dinner table. Because she is playful, loyal, and lovable, Zinga is considered the guiding spirit of the company.

In developing its games, Zynga goes through a game development cycle that starts with the initial gaming concept, program development, and ends with testing and debugging errors. Businesses also go through a cycle of accounting activities that begins with

recording transactions and ends with preparing financial statements and getting the accounting records ready for recording the next period's transactions.

In Chapter 1, the initial accounting cycle for **NetSolutions** began with Chris Clark's investment in the business on November 1,2015. The cycle continued with recording NetSolutions' transactions for November and December, as we discussed and illustrated in Chapters 1 and 2. In Chapter 3, the cycle continued when the adjusting entries for the two months ending December 31, 2015, were recorded. In this chapter, the cycle is completed for NetSolutions by preparing financial statements and getting the accounts ready for recording transactions of the next period.

Source: Zynga.com

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe the flow of accounting information from the unadjusted trial balance into the adjusted trial balance and financial statements. Flow of Accounting Information	EE 4-1
Prepare financial statements from adjusted account balances. Financial Statements Income Statement Retained Earnings Statement Balance Sheet	EE 4-2 EE 4-3
Prepare closing entries. Closing Entries Journalizing and Posting Closing Entries Post-Closing Trial Balance	EE 4-4
Describe the accounting cycle. Accounting Cycle	EE 4-5
Illustrate the accounting cycle for one period. Illustration of the Accounting Cycle	
Explain what is meant by the fiscal year and the natural business year. Fiscal Year	
Describe and illustrate the use of working capital and the current ratio in evaluating a company's financial condition. Financial Analysis and Interpretation: Working Capital and Current Ratio	EE 4-6
At a Gl	ance 4 Page 184





Flow of Accounting Information

The process of adjusting the accounts and preparing financial statements is one of the most important in accounting. Using the **NetSolutions** illustration from Chapters 1–3 and an end-of-period spreadsheet, the flow of accounting data in adjusting accounts and preparing financial statements are summarized in Exhibit 1.

The end-of-period spreadsheet in Exhibit 1 begins with the unadjusted trial balance. The unadjusted trial balance verifies that the total of the debit balances equals the total of the credit balances. If the trial balance totals are unequal, an error has occurred. Any errors must be found and corrected before the end-of-period process can continue.

The adjustments for NetSolutions from Chapter 3 are shown in the Adjustments columns of the spreadsheet. Cross-referencing (by letters) the debit and credit of each adjustment is useful in reviewing the effect of the adjustments on the unadjusted account balances. The adjustments are normally entered in the order in which the data are assembled. If the titles of the accounts to be adjusted do not appear in the unadjusted trial balance, the accounts are inserted in their proper order in the Account Title column. The total of the Adjustments columns verifies that the total debits equal the total credits for the adjusting entries. The total of the Debit column must equal the total of the Credit column.

The adjustments in the spreadsheet are added to or subtracted from the amounts in the Unadjusted Trial Balance columns to arrive at the amounts inserted in the Adjusted Trial Balance columns. In this way, the Adjusted Trial Balance columns of the spreadsheet illustrate the effect of the adjusting entries on the unadjusted accounts. The totals of the Adjusted Trial Balance columns verify that the totals of the debit and credit balances are equal after adjustment.

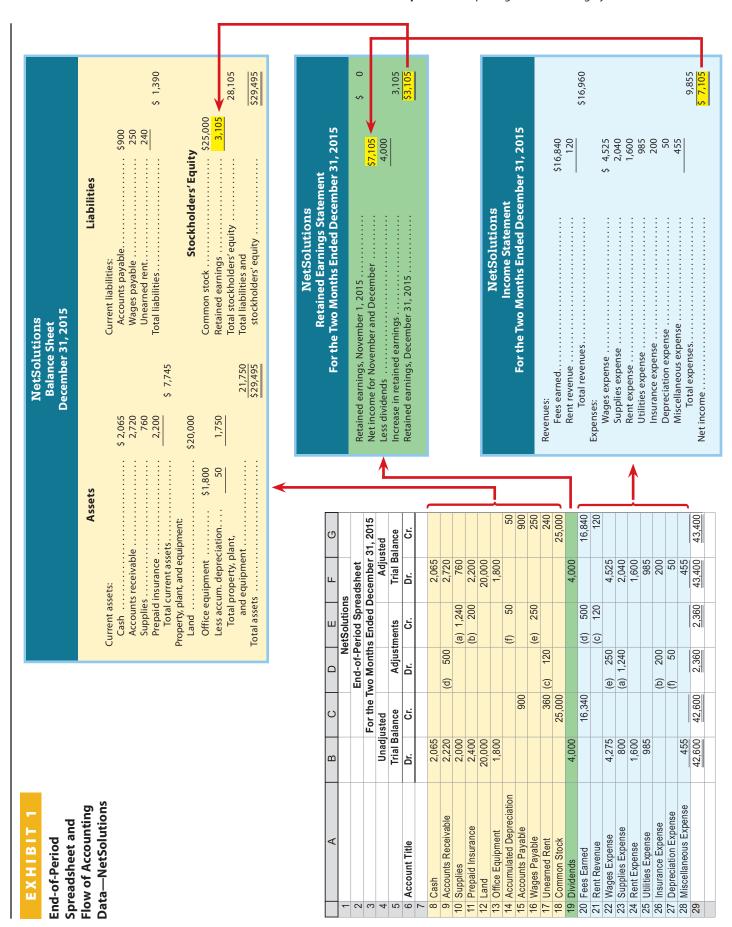


Exhibit 1 illustrates the flow of accounts from the adjusted trial balance into the financial statements as follows:

- 1. The revenue and expense accounts (spreadsheet lines 20–28) flow into the income statement.
- 2. The dividends account (spreadsheet line 19) flows into the retained earnings statement. The net income of \$7,105 also flows into the retained earnings statement from the income statement.
- 3. The asset, liability, and common stock accounts (spreadsheet lines 8–18) flow into the balance sheet. The end-of-the-period retained earnings of \$3,105 also flows into the balance sheet from the retained earnings statement.

To summarize, Exhibit 1 illustrates the process by which accounts are adjusted. In addition, Exhibit 1 illustrates how the adjusted accounts flow into the financial statements. The financial statements for NetSolutions can be prepared directly from Exhibit 1.

The spreadsheet in Exhibit 1 is not required. However, many accountants prepare such a spreadsheet, sometimes called a *work sheet*, as part of the normal end-of-period process. The primary advantage in doing so is that it allows managers and accountants to see the effect of adjustments on the financial statements. This is especially useful for adjustments that depend upon estimates. Such estimates and their effect on the financial statements are discussed in later chapters.¹

Example Exercise 4-1 Flow of Accounts into Financial Statements



The balances for the accounts that follow appear in the Adjusted Trial Balance columns of the end-of-period spreadsheet. Indicate whether each account would flow into the income statement, retained earnings statement, or balance sheet.

- 1. Office Equipment
- 2. Utilities Expense
- 3. Accumulated Depreciation—Equipment
- 4. Unearned Rent

- 5. Fees Earned
- 6. Dividends
- 7. Rent Revenue
- 8. Supplies

Follow My Example 4-1

- 1. Balance sheet
- 2. Income statement
- 3. Balance sheet
- 4. Balance sheet

- 5. Income statement
- 6. Retained earnings statement
- 7. Income statement
- 8. Balance sheet

Practice Exercises: PE 4-1A, PE 4-1B



Financial Statements

Using the adjusted trial balance shown in Exhibit 1, the financial statements for **NetSolutions** can be prepared. The income statement, the retained earnings statement, and the balance sheet are shown in Exhibit 2.

Income Statement

The income statement is prepared directly from the Adjusted Trial Balance columns of the Exhibit 1 spreadsheet, beginning with fees earned of \$16,840. The expenses in the income statement in Exhibit 2 are listed in order of size, beginning with the larger items. Miscellaneous expense is the last item, regardless of its amount.

¹ The appendix to this chapter describes and illustrates how to prepare an end-of-period spreadsheet that includes financial statement columns.

Financial Statements—NetSolutions

NetSolutions Income Statement For the Two Months Ended December 31, 201	5	
Fees earned	\$16,840	
Rent revenue	120	
Total revenues		\$16,960
Expenses:	¢ 4525	
Wages expenseSupplies expense	\$ 4,525 2,040	
Rent expense	1,600	
Utilities expense	985	
Insurance expense	200	
Depreciation expense	50	
Miscellaneous expense	455	
Total expenses		9,855
Net income		\$ 7,105 ——
NetSolutions Retained Earnings Statement For the Two Months Ended December 31, 201	5	
Retained Earnings Statement For the Two Months Ended December 31, 201 Retained earnings, November 1, 2015		\$ 0
Retained Earnings Statement For the Two Months Ended December 31, 201	\$7,105 4,000	\$ 0
Retained Earnings Statement For the Two Months Ended December 31, 201 Retained earnings, November 1, 2015	\$7,105	\$ 0

		NetSolu Balance : December :	Sheet	
Assets			Liabilities	
Current assets:			Current liabilities:	
Cash	\$ 2,065		Accounts payable\$900	
Accounts receivable	2,720		Wages payable	
Supplies	760		Unearned rent	ć 1 300
Prepaid insurance	2,200		Total liabilities	\$ 1,390
Total current assets		\$ 7,745		
Property, plant, and equipment:				
Land	\$20,000		Stockholders' Equity	
Office equipment\$1,800			Common stock	00
Less accum. depreciation 50	1,750		Retained earnings	<mark>105</mark>
Total property, plant,			Total stockholders' equity	28,105
and equipment		21,750	Total liabilities and	
Total assets		\$29,495	stockholders' equity	\$29,495

Integrity, Objectivity, and Ethics in Business



CEO'S HEALTH?

How much and what information to disclose in financial statements and to investors presents a common ethical dilemma for managers and accountants. For example, Steve Jobs, co-founder and CEO of Apple Inc., had been diagnosed and treated for pancreatic cancer. Apple Inc. had insisted that the status of Steve Jobs's health was a "private" matter and did not have to be disclosed to investors. Apple maintained this position even though

Jobs was a driving force behind Apple's innovation and financial success.

However, in response to increasing investor concerns and speculation, Jobs released a letter on January 5, 2009, to investors on his health. The letter indicated that his recent weight loss was due to a hormone imbalance and not due to the recurrence of cancer. On October 5, 2011, Steve Jobs died at the age of 56.

Retained Earnings Statement

The first item normally presented on the retained earnings statement is the balance of the retained earnings account at the beginning of the period. Since NetSolutions began operations on November 1, this balance is zero in Exhibit 2. Then, the retained earnings statement shows the net income for the two months ended December 31, 2015. The amount of dividends is deducted from the net income to arrive at the retained earnings as of December 31, 2015.

For the following period, the beginning balance of retained earnings for NetSolutions is the ending balance that was reported for the previous period. For example, assume that during 2016, NetSolutions earned net income of \$149,695 and paid dividends of \$24,000. The retained earnings statement for the year ending December 31, 2016, for NetSolutions is as follows:

NetSolutions Retained Earnings Statement For the Year Ended December 31, 2016

Retained earnings, January 1, 2016		\$ 3,105
Net income for the year	\$149,695	
Less dividends	24,000	
Increase in retained earnings		125,695
Retained earnings, December 31, 2016		\$128,800

For NetSolutions, the amount of dividends was less than the net income. If the dividends had exceeded the net income, the order of the net income and the dividends would have been reversed. The difference between the two items would then be deducted from the beginning Retained Earnings balance. Other factors, such as a net loss, may also require some change in the form of the retained earnings statement, as shown in the following example:

Retained earnings, January 1, 20—		\$45,000
Net loss for the year	\$5,600	
Dividends	9,500	
Decrease in retained earnings		15,100
Retained earnings, December 31, 20—		\$29,900

Example Exercise 4-2 Retained Earnings Statement



Zack Gaddis owns and operates Gaddis Employment Services. On January 1, 2015, Retained Earnings had a balance of \$186,000. During the year, Zack invested an additional \$40,000 in the business in exchange for common stock. In addition, dividends of \$25,000 were paid during the year. For the year ended December 31, 2015, Gaddis Employment Services reported a net income of \$18,750. Prepare a retained earnings statement for the year ended December 31, 2015.

(Continued)

Follow My Example 4-2 **Gaddis Employment Services** Retained Earnings Statement For the Year Ended December 31, 2015 Retained earnings, January 1, 2015..... \$186,000 \$25,000 Dividends 18,750 Less net income 6,250 Decrease in retained earnings Retained earnings, December 31, 2015..... \$179,750 ____ Practice Exercises: PE 4-2A, PE 4-2B

Balance Sheet

The balance sheet is prepared directly from the Adjusted Trial Balance columns of the Exhibit 1 spreadsheet, beginning with Cash of \$2,065. The asset and liability amounts are taken from the spreadsheet. The retained earnings amount, however, is taken from the retained earnings statement, as illustrated in Exhibit 2.

The balance sheet in Exhibit 2 shows subsections for assets and liabilities. Such a balance sheet is a *classified balance sheet*. These subsections are described next.

Assets Assets are commonly divided into two sections on the balance sheet: (1) current assets and (2) property, plant, and equipment.

Current Assets Cash and other assets that are expected to be converted to cash or sold or used up usually within one year or less, through the normal operations of the business, are called **current assets**. In addition to cash, the current assets may include notes receivable, accounts receivable, supplies, and other prepaid expenses.

Notes receivable are amounts that customers owe. They are written promises to pay the amount of the note and interest. Accounts receivable are also amounts customers owe, but they are less formal than notes. Accounts receivable normally result from providing services or selling merchandise on account. Notes receivable and accounts receivable are current assets because they are usually converted to cash within one year or less.

Property, Plant, and Equipment The property, plant, and equipment section may also be described as **fixed assets** or **plant assets**. These assets include equipment, machinery, buildings, and land. With the exception of land, as discussed in Chapter 3, fixed assets depreciate over a period of time. The original cost, accumulated depreciation, and book value of each major type of fixed asset are normally reported on the balance sheet or in the notes to the financial statements.

Liabilities Liabilities are the amounts the business owes to creditors. Liabilities are commonly divided into two sections on the balance sheet: (1) current liabilities and (2) long-term liabilities.

Current Liabilities Liabilities that will be due within a short time (usually one year or less) and that are to be paid out of current assets are called **current liabilities**. The most common liabilities in this group are notes payable and accounts payable. Other current liabilities may include Wages Payable, Interest Payable, Taxes Payable, and Unearned Fees.

Long-Term Liabilities Liabilities that will not be due for a long time (usually more than one year) are called **long-term liabilities**. If NetSolutions had long-term liabilities, they would be reported below the current liabilities. As long-term liabilities come due and are to be paid within one year, they are reported as current liabilities. If they are to be renewed rather than paid, they would continue to be reported as long term. When an asset is pledged as security for a liability, the obligation may be called a *mortgage note payable* or a *mortgage payable*.

Stockholders' Equity The stockholders' right to the assets of the business is presented on the balance sheet below the liabilities section. The stockholders' equity of NetSolutions consists of common stock and retained earnings. The stockholders' equity is added to the total liabilities, and this total must be equal to the total assets.

Note:

Two common classes of assets are current assets and property, plant, and equipment.

Note:

Two common classes of liabilities are current liabilities and long-term liabilities.

Example Exercise 4-3 Classified Balance Sheet



The following accounts appear in an adjusted trial balance of Hindsight Consulting. Indicate whether each account would be reported in the (a) current asset; (b) property, plant, and equipment; (c) current liability; (d) long-term liability; or (e) stockholders' equity section of the December 31, 2015, balance sheet of Hindsight Consulting.

- 1. Common Stock
- Notes Receivable (due in six months)
- 3. Notes Payable (due in 10 years)

- 5. Cash
- 6. Unearned Rent (three months)
- 7. Accumulated Depreciation—Equipment
- 8. Accounts Payable

Follow My Example 4-3

- 1. Stockholders' equity
- 2. Current asset
- 3. Long-term liability
- 4. Property, plant, and equipment

- 5. Current asset
- 6. Current liability
- 7. Property, plant, and equipment
- 8. Current liability

Practice Exercises: PE 4-3A, PE 4-3B

International 🔀 Connection





IFRS INTERNATIONAL DIFFERENCES

Financial statements prepared under accounting practices in other countries often differ from those prepared under generally accepted accounting principles in the United States. This is to be expected because cultures and market structures differ from country to country.

To illustrate, BMW Group prepares its financial statements under International Financial Reporting Standards as adopted by the European Union. In doing so, BMW's balance sheet reports fixed assets first, followed by current assets. It also reports stockholders' equity before the liabilities. In contrast, balance sheets prepared under U.S. accounting principles report current assets followed by fixed assets and current liabilities followed by long-term liabilities and stockholders' equity. The U.S. form of balance sheet is organized to emphasize creditor interpretation and analysis. For example, current assets and current liabilities are presented first to facilitate their interpretation and analysis by creditors. Likewise, to emphasize their importance, liabilities are reported before stockholders' equity.*

Regardless of these differences, the basic principles underlying the accounting equation and the doubleentry accounting system are the same in Germany and the United States. Even though differences in recording and reporting exist, the accounting equation holds true: The total assets still equal the total liabilities and stockholders' equity.

*Examples of U.S. and IFRS financial statement reporting differences are further discussed and illustrated in Appendix C.



Closing Entries

As discussed in Chapter 3, the adjusting entries are recorded in the journal at the end of the accounting period. For NetSolutions, the adjusting entries are shown in Exhibit 9 of Chapter 3.

After the adjusting entries are posted to NetSolutions' ledger, shown in Exhibit 6, the ledger agrees with the data reported on the financial statements.

The balances of the accounts reported on the balance sheet are carried forward from year to year. Because they are relatively permanent, these accounts are called permanent accounts or real accounts. For example, Cash, Accounts Receivable, Equipment, Accumulated Depreciation, Accounts Payable, Common Stock, and Retained Earnings are permanent accounts.

The balances of the accounts reported on the income statement are not carried forward from year to year. Also, the balance of the dividends account, which is reported on the retained earnings statement, is not carried forward. Because these accounts report amounts for only one period, they are called temporary accounts or **nominal accounts**. Temporary accounts are not carried forward because they relate only to one period. For example, the Fees Earned of \$16,840 and Wages Expense of \$4,525 for NetSolutions shown in Exhibit 2 are for the two months ending December 31, 2015, and should not be carried forward to 2016.

At the beginning of the next period, temporary accounts should have zero balances. To achieve this, temporary account balances are transferred to permanent accounts at the end of the accounting period. The entries that transfer these balances are called **closing entries**. The transfer process is called the **closing process** and is sometimes referred to as **closing the books**.

The closing process involves the following four steps:

- Step 1. Revenue account balances are transferred to an account called Income Summary.
- Step 2. Expense account balances are transferred to an account called Income Summary.
- Step 3. The balance of Income Summary (net income or net loss) is transferred to the retained earnings account.
- Step 4. The balance of the dividends account is transferred to the retained earnings account.

Exhibit 3 diagrams the closing process.

Note:

Closing entries transfer the balances of temporary accounts to the retained earnings account.

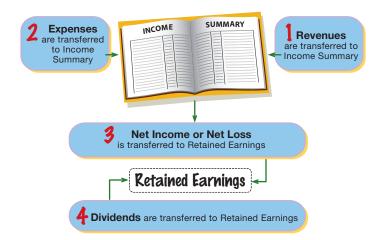


EXHIBIT 3

The Closing Process

Income Summary is a temporary account that is only used during the closing process. At the beginning of the closing process, Income Summary has no balance. During the closing process, Income Summary will be debited and credited for various amounts. At the end of the closing process, Income Summary will again have no balance. Because Income Summary has the effect of clearing the revenue and expense accounts of their balances, it is sometimes called a **clearing account**. Other titles used for this account include Revenue and Expense Summary, Profit and Loss Summary, and Income and Expense Summary.

The four closing entries required in the closing process are as follows:

- 1. Debit each revenue account for its balance and credit Income Summary for the total revenue.
- Credit each expense account for its balance and debit Income Summary for the total expenses.
- 3. Debit Income Summary for its balance (net income) and credit the retained earnings account
- Debit the retained earnings account for the balance of the dividends account and credit the dividends account.

In the case of a net loss, Income Summary will have a debit balance after the first two closing entries. In this case, credit Income Summary for the amount of its balance and debit the retained earnings account for the amount of the net loss.

Closing entries are recorded in the journal and are dated as of the last day of the accounting period. In the journal, closing entries are recorded immediately following the adjusting entries. The caption, *Closing Entries*, is often inserted above the closing entries to separate them from the adjusting entries.

Note:

The income summary account does not appear on the financial statements.

It is possible to close the temporary revenue and expense accounts without using a clearing account such as Income Summary. In this case, the balances of the revenue and expense accounts are closed directly to the retained earnings account.

Journalizing and Posting Closing Entries

A flowchart of the four closing entries for **NetSolutions** is shown in Exhibit 4. The balances in the accounts are those shown in the Adjusted Trial Balance columns of the end-of-period spreadsheet shown in Exhibit 1.

EXHIBIT 4

Flowchart of Closing Entries for NetSolutions

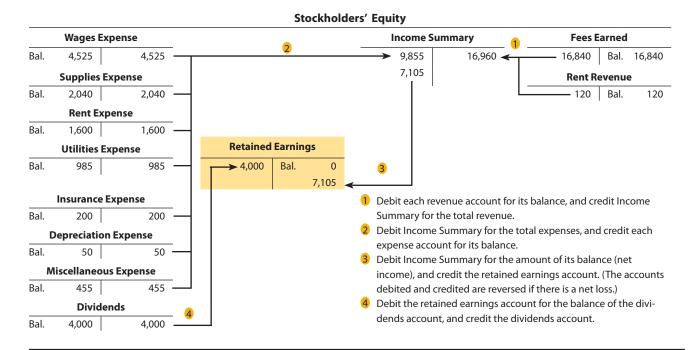


EXHIBIT 5

Closing Entries, NetSolutions

Journal						
Date Description		Post. Ref.	Debit	Credit		
²⁰¹⁵ Dec.	31	Closing Entries Fees Earned Rent Revenue Income Summary Income Summary Wages Expense Supplies Expense Rent Expense Utilities Expense Insurance Expense Depreciation Expense Miscellaneous Expense	41 42 34 34 51 52 53 54 55 56	16,840 120 9,855	16,960 4,525 2,040 1,600 985 200 50 455	
	31	Income Summary Retained Earnings	34 32	7,105	7,105	
	31	Retained Earnings Dividends	32 33	4,000	4,000	

The closing entries for **NetSolutions** are shown in Exhibit 5. The account titles and balances for these entries may be obtained from the end-of-period spreadsheet, the adjusted trial balance, the income statement, the retained earnings statement, or the ledger.

The closing entries are posted to NetSolutions' ledger as shown in Exhibit 6. Income Summary has been added to NetSolutions' ledger in Exhibit 6 as account number 34. After the closing entries are posted, NetSolutions' ledger has the following characteristics:

- The balance of Retained Earnings of \$3,105 agrees with the amount reported on the retained earnings statement and the balance sheet.
- The revenue, expense, and dividends accounts will have zero balances.

As shown in Exhibit 6, the closing entries are normally identified in the ledger as "Closing." In addition, a line is often inserted in both balance columns after a closing entry is posted. This separates next period's revenue, expense, and dividend transactions from those of the current period. Next period's transactions will be posted directly below the closing entry.

Example Exercise 4-4 Closing Entries



After the accounts have been adjusted at July 31, the end of the fiscal year, the following balances are taken from the ledger of Cabriolet Services Co.:

Retained Earnings	\$615,850
Dividends	25,000
Fees Earned	380,450
Wages Expense	250,000
Rent Expense	65,000
Supplies Expense	18,250
Miscellaneous Expense	6,200

Journalize the four entries required to close the accounts.

Follow	Μv	Exam	ıble	4-4

July 31	Fees Earned	380,450
	Income Summary	380,450
31	Income Summary	339,450
	Wages Expense	250,000
	Rent Expense	65,000
	Supplies Expense	18,250
	Miscellaneous Expense	6,200
31	Income Summary	41,000
	Retained Earnings	41,000
31	Retained Earnings	25,000
	Dividends	25,000

Practice Exercises: PE 4-4A, PE 4-4B

Post-Closing Trial Balance

A post-closing trial balance is prepared after the closing entries have been posted. The purpose of the post-closing (after closing) trial balance is to verify that the ledger is in balance at the beginning of the next period. The accounts and amounts should agree exactly with the accounts and amounts listed on the balance sheet at the end of the period. The post-closing trial balance for **NetSolutions** is shown in Exhibit 7.

Ledger, NetSolutions

Accou	I nt Cash	Account	No. 11			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015		1	25.000		25.000	
Nov. 1		1	25,000	20.000	25,000	
18		1	7.500	20,000	5,000	
30		1	7,500	3,650	12,500	
				· ·	8,850	
30		1		950	7,900	
30		2		2,000	5,900	
Dec. 1		2		2,400	3,500	
1		2	260	800	2,700	
1		2	360	100	3,060	
6		2		180	2,880	
11		2		400	2,480	
13		3	2 400	950	1,530	
16		3	3,100		4,630	
20		3		900	3,730	
21		3	650		4,380	
23		3		1,450	2,930	
27		3		1,200	1,730	
31		3		310	1,420	
31		4		225	1,195	
31		4	2,870		4,065	
31		4		2,000	2,065	

Accou	I nt Accounts	Account No. 12					
					Bala	nce	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Dec. 16		3	1,750		1,750		
21		3		650	1,100		
31		4	1,120		2,220		
31	Adjusting	5	500		2,720		

Accou	int Supplies				Account No. 14		
					Bala	nce	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov.10		1	1,350		1,350		
30		1		800	550		
Dec. 23		3	1,450		2,000		
31	Adjusting	5		1,240	760		

unt Prepaid II	Account No. 15					
				Bala	nce	
Item	Post. Ref.	Debit	Credit	Debit	Credit	
	2	2 400		2 400		
Adiustina		2,400	200			
	Item	Item Ref.	ltem Post. Ref. Debit	Item Post. Ref. Debit Credit	Item Post. Ref. Debit Credit Debit 2 2,400 2,400	

Accou	I nt Land				Account	No. 17
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015 Nov. 5		1	20,000		20,000	

Αςςοι	I nt Office Equ	Account No. 18				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Dec. 4		2	1,800		1,800	

Αςςοι	int Accumulo	Account No. 19					
					Bala	ance	
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit	
2015 Dec. 31	Adjusting	5		50		50	

Accou	Account Accounts Payable Account No. 21									
					Bala	nce				
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit				
2015										
Nov.10		1		1,350		1,350				
30		1	950			400				
Dec. 4		2		1,800		2,200				
11		2	400			1,800				
20		3	900			900				

Αςςοι	int Wages Po	Account No. 22				
					Bala	nce
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Dec. 31	Adjusting	5		250		250

Accou	int Unearned	Account No. 23				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁵ Dec. 1	Adjusting	2 5	120	360		360 240

Accou	I nt Common	Account	No. 31			
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
Nov. 1				25,000		25,000

Ledger, NetSolutions (Concluded)

Αςςοι	I nt Retained	Account No. 32				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 1						0
Dec. 31	Closing	6		7,105		7,105
31	Closing	6	4,000			3,105

Accou	I nt Dividend.	Account No. 33				
		Post.			Bala	nce
Date	Item	Ref.	Debit	Credit	Debit	Credit
2015						
Nov.30		2	2,000		2,000	
Dec. 31		4	2,000		4,000	
31	Closing	6		4,000	_	_

Account Income Summary					Account No. 34		
		Post.		Ba		lance	
Date	Item	Ref.	Debit	Credit	Debit	Credit	
2015							
Dec. 31	Closing	6		16,960		16,960	
31	Closing	6	9,855			7,105	
31	Closing	6	7,105		_	_	

Accou	I nt Fees Earn	Account No. 41				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov.18		1		7,500		7,500
Dec. 16		3		3,100		10,600
16		3		1,750		12,350
31		4		2,870		15,220
31		4		1,120		16,340
31	Adjusting	5		500		16,840
31	Closing	6	16,840		_	_

Account Rent Revenue					Account No. 42		
					Bala	nce	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Dec. 31	Adjusting	5		120		120	
31	Closing	6	120		_	_	

Accou	Account Wages Expense					Account No. 51	
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov.30		1	2,125		2,125		
Dec. 13		3	950		3,075		
27		3	1,200		4,275		
31	Adjusting	5	250		4,525		
31	Closing	6		4,525	_	_	

Accou	ı nt Supplies l	Account No. 52				
					Balance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov. 30		1	800		800	
Dec. 31	Adjusting	5	1,240		2,040	
31	Closing	6		2,040	_	_

Accou	I nt Rent Expe		Account No. 53				
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Nov. 30		1	800		800		
Dec. 1		2	800		1,600		
31	Closing	6		1,600	–	_	

Accou	I nt Utilities E.		Account	No. <i>54</i>		
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov.30		1	450		450	
Dec. 31		3	310		760	
31		4	225		985	
31	Closing	6		985	_	_

Account Insurance Expense Account No. 55							
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2015							
Dec. 31	Adjusting	5	200		200		
31	Closing	6		200	_	_	

Αςςοι	int Deprecia	Account No. 56				
					Balance	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Dec. 31	Adjusting	5	50		50	
31	Closing	6		50	_	

Accou	ı nt Miscellan	Account No. 59				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2015						
Nov.30		1	275		275	
Dec. 6		2	180		455	
31	Closing	6		455	_	_

Post-Closing Trial Balance, NetSolutions

NetSolutions Post-Closing Trial Balance December 31, 2015		
	Debit Balances	Credit Balances
Cash	2,065	
Accounts Receivable	2,720	
Supplies	760	
Prepaid Insurance	2,200	
Land	20,000	
Office Equipment	1,800	
Accumulated Depreciation		50
Accounts Payable		900
Wages Payable		250
Unearned Rent		240
Common Stock		25,000
Retained Earnings		3,105
	29,545	29,545



Accounting Cycle

The accounting process that begins with analyzing and journalizing transactions and ends with the post-closing trial balance is called the **accounting cycle**. The steps in the accounting cycle are as follows:

- Step 1. Transactions are analyzed and recorded in the journal.
- Step 2. Transactions are posted to the ledger.
- Step 3. An unadjusted trial balance is prepared.
- Step 4. Adjustment data are assembled and analyzed.
- Step 5. An optional end-of-period spreadsheet is prepared.
- Step 6. Adjusting entries are journalized and posted to the ledger.
- Step 7. An adjusted trial balance is prepared.
- Step 8. Financial statements are prepared.
- Step 9. Closing entries are journalized and posted to the ledger.
- Step 10. A post-closing trial balance is prepared.²

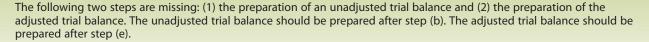
Example Exercise 4-5 Accounting Cycle



From the following list of steps in the accounting cycle, identify what two steps are missing:

- a. Transactions are analyzed and recorded in the journal:
- b. Transactions are posted to the ledger.
- c. Adjustment data are assembled and analyzed.
- d. An optional end-of-period spreadsheet is prepared.
- e. Adjusting entries are journalized and posted to the ledger.
- f. Financial statements are prepared.
- g. Closing entries are journalized and posted to the ledger.
- h. A post-closing trial balance is prepared.

Follow My Example 4-5



Practice Exercises: PE 4-5A, PE 4-5B

² Some accountants include the journalizing and posting of "reversing entries" as the last step in the accounting cycle. Because reversing entries are not required, they are described and illustrated in Appendix E, which is available on the product Web site at www.cengagebrain.com.

Exhibit 8 illustrates the accounting cycle in graphic form. It also illustrates how the accounting cycle begins with the source documents for a transaction and flows through the accounting system and into the financial statements.

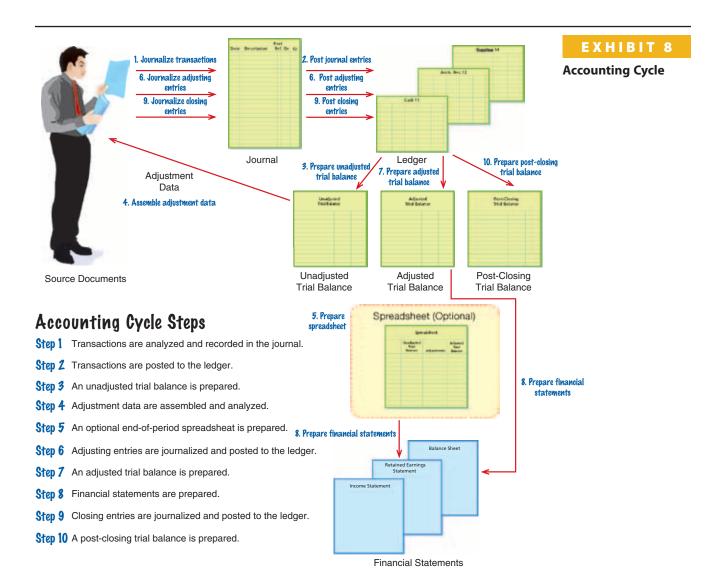


Illustration of the Accounting Cycle

Illustrate the accounting cycle for one period.

In this section, the complete accounting cycle for one period is illustrated. Assume that for several years Kelly Pitney has operated a part-time consulting business from her home. As of April 1, 2016, Kelly decided to move to rented quarters and to operate the business on a full-time basis. The business will be known as Kelly Consulting. During April, Kelly Consulting entered into the following transactions:

- Apr. 1. The following assets were received from Kelly Pitney in exchange for common stock: cash, \$13,100; accounts receivable, \$3,000; supplies, \$1,400; and office equipment, \$12,500. There were no liabilities received.
 - 1. Paid three months' rent on a lease rental contract, \$4,800.
 - 2. Paid the premiums on property and casualty insurance policies, \$1,800.
 - 4. Received cash from clients as an advance payment for services to be provided and recorded it as unearned fees, \$5,000.

- Apr. 5. Purchased additional office equipment on account from Office Station Co., \$2,000.
 - 6. Received cash from clients on account, \$1,800.
 - 10. Paid cash for a newspaper advertisement, \$120.
 - 12. Paid Office Station Co. for part of the debt incurred on April 5, \$1,200.
 - 12. Recorded services provided on account for the period April 1-12, \$4,200.
 - 14. Paid part-time receptionist for two weeks' salary, \$750.
 - 17. Recorded cash from cash clients for fees earned during the period April 1-16, \$6,250.
 - 18. Paid cash for supplies, \$800.
 - 20. Recorded services provided on account for the period April 13-20, \$2,100.
 - 24. Recorded cash from cash clients for fees earned for the period April 17-24, \$3,850.
 - 26. Received cash from clients on account, \$5,600.
 - 27. Paid part-time receptionist for two weeks' salary, \$750.
 - 29. Paid telephone bill for April, \$130.
 - 30. Paid electricity bill for April, \$200.
 - 30. Recorded cash from cash clients for fees earned for the period April 25-30, \$3,050.
 - 30. Recorded services provided on account for the remainder of April, \$1,500.
 - 30. Paid dividends, \$6,000.

Step 1. Analyzing and Recording Transactions in the Journal

The first step in the accounting cycle is to analyze and record transactions in the journal using the double-entry accounting system. As illustrated in Chapter 2, transactions are analyzed and journalized using the following steps:

- Step 1. Carefully read the description of the transaction to determine whether an asset, liability, common stock, retained earnings, dividends, revenue, or expense account is affected.
- Step 2. For each account affected by the transaction, determine whether the account increases or decreases.
- Step 3. Determine whether each increase or decrease should be recorded as a debit or a credit, following the rules of debit and credit shown in Exhibit 3 of Chapter 2.
- Step 4. Record the transaction using a journal entry.

The company's chart of accounts is useful in determining which accounts are affected by the transaction. The chart of accounts for Kelly Consulting is shown in Exhibit 9.

EXHIBIT 9

Chart of Accounts for Kelly Consulting

11 Cash		32	Retained Earnings
12 Accounts	s Receivable	33	Dividends
14 Supplies		34	Income Summary
15 Prepaid F	Rent	41	Fees Earned
16 Prepaid I	nsurance	51	Salary Expense
18 Office Eq	Juipment	52	Rent Expense
19 Accumul	ated Depreciation	53	Supplies Expense
21 Accounts	s Payable	54	Depreciation Expense
22 Salaries F	^o ayable	55	Insurance Expense
23 Unearne	d Fees	59	Miscellaneous Expense
31 Common	n Stock		

After analyzing each of Kelly Consulting's transactions for April, the journal entries are recorded as shown in Exhibit 10.

Step 2. Posting Transactions to the Ledger

Periodically, the transactions recorded in the journal are posted to the accounts in the ledger. The debits and credits for each journal entry are posted to the accounts in the

		Page 1			
Date		Description		Debit	Credit
2016 Apr.	1	Cash	11	13,100	
,,,,,,		Accounts Receivable	12	3,000	
		Supplies	14	1,400	
		Office Equipment	18	12,500	
		Common Stock	31		30,000
	1	Prepaid Rent	15	4,800	
		Cash	11		4,800
	2	Prepaid Insurance	16	1,800	
		Cash	11		1,800
	4	Cash	11	5,000	
		Unearned Fees	23		5,000
	5	Office Equipment	18	2,000	
		Accounts Payable	21		2,000
	6	Cash	11	1,800	
		Accounts Receivable	12		1,800
	10	Miscellaneous Expense	59	120	
		Cash	11		120
	12	Accounts Payable	21	1,200	
		Cash	11		1,200
	12	Accounts Receivable	12	4,200	
		Fees Earned	41		4,200
	14	Salary Expense	51	750	
		Cash	11		750

Journal Entries for April, Kelly Consulting

Journal							
Date		Description	Post. Ref.	Debit	Credit		
2016 Apr.	17	Cash Fees Earned	11 41	6,250	6,250		
	18	Supplies Cash	14 11	800	800		
	20	Accounts Receivable Fees Earned	12 41	2,100	2,100		
	24	Cash Fees Earned	11 41	3,850	3,850		
	26	Cash Accounts Receivable	11 12	5,600	5,600		
	27	Salary Expense Cash	51 11	750	750		
	29	Miscellaneous Expense Cash	59 11	130	130		

(Continued)

Journal Entries for April, Kelly Consulting (Concluded)

	Journal			Page 2
Date	Description	Post. Ref.	Debit	Credit
30	Miscellaneous Expense Cash	59 11	200	200
30	Cash Fees Earned	11 41	3,050	3,050
30	Accounts Receivable Fees Earned	12 41	1,500	1,500
30	Dividends Cash	33 11	6,000	6,000

order in which they occur in the journal. As illustrated in Chapters 2 and 3, journal entries are posted to the accounts using the following four steps:

- Step 1. The date is entered in the Date column of the account.
- Step 2. The amount is entered into the Debit or Credit column of the account.
- Step 3. The journal page number is entered in the Posting Reference column.
- Step 4. The account number is entered in the Posting Reference (Post. Ref.) column in the journal.

The journal entries for Kelly Consulting have been posted to the ledger shown in Exhibit 18.

Step 3. Preparing an Unadjusted Trial Balance

An unadjusted trial balance is prepared to determine whether any errors have been made in posting the debits and credits to the ledger. The unadjusted trial balance shown in Exhibit 11 does not provide complete proof of the accuracy of the ledger. It indicates only that the debits and the credits are equal. This proof is of value, however, because errors often affect the equality of debits and credits. If the two totals of a trial balance are not equal, an error has occurred that must be discovered and corrected.

The unadjusted account balances shown in Exhibit 11 were taken from Kelly Consulting's ledger shown in Exhibit 18, before any adjusting entries were recorded.

Step 4. Assembling and Analyzing Adjustment Data

Before the financial statements can be prepared, the accounts must be updated. The four types of accounts that normally require adjustment include prepaid expenses, unearned revenue, accrued revenue, and accrued expenses. In addition, depreciation expense must be recorded for fixed assets other than land. The following data have been assembled on April 30, 2016, for analysis of possible adjustments for Kelly Consulting:

- a. Insurance expired during April is \$300.
- b. Supplies on hand on April 30 are \$1,350.
- c. Depreciation of office equipment for April is \$330.
- d. Accrued receptionist salary on April 30 is \$120.
- e. Rent expired during April is \$1,600.
- f. Unearned fees on April 30 are \$2,500.

Kelly Consulting Unadjusted Trial Balance April 30, 2016		
	Debit Balances	Credit Balances
Cash	22,100	
Accounts Receivable	3,400	
Supplies	2,200	
Prepaid Rent	4,800	
Prepaid Insurance	1,800	
Office Equipment	14,500	
Accumulated Depreciation		0
Accounts Payable		800
Salaries Payable		0
Unearned Fees		5,000
Common Stock		30,000
Dividends	6,000	
Fees Earned		20,950
Salary Expense	1,500	
Rent Expense	0	
Supplies Expense	0	
Depreciation Expense	0	
Insurance Expense	0	
Miscellaneous Expense	450	
	56,750	56,750

Unadjusted Trial Balance, Kelly Consulting

Step 5. Preparing an Optional End-of-Period Spreadsheet

Although an end-of-period spreadsheet is not required, it is useful in showing the flow of accounting information from the unadjusted trial balance to the adjusted trial balance. In addition, an end-of-period spreadsheet is useful in analyzing the impact of proposed adjustments on the financial statements. The end-of-period spreadsheet for Kelly Consulting is shown in Exhibit 12.

	А	В	С		D		Е	F	G		
1				Kelly Consulting							
2				End	d-of-P	erio	d Spre	eadsheet			
3			For the Month Ended April 30, 2016								
4		Unadj	usted					Adju	sted		
5		Trial B	alance		Adjust	tmer	nts	Trial B	alance		
6	Account Title	Dr.	Cr.		Dr.		Cr.	Dr.	Cr.		
7											
8	Cash	22,100						22,100			
9	Accounts Receivable	3,400						3,400			
10	Supplies	2,200				(b)	850	1,350			
11	Prepaid Rent	4,800				(e)	1,600	3,200			
12	Prepaid Insurance	1,800				(a)	300	1,500			
13	Office Equipment	14,500						14,500			
14	Accum. Depreciation					(c)	330		330		
15	Accounts Payable		800						800		
16	Salaries Payable					(d)	120		120		
17	Unearned Fees		5,000	(f)	2,500				2,500		
18	Common Stock		30,000						30,000		
19	Dividends	6,000						6,000			
20	Fees Earned		20,950			(f)	2,500		23,450		
21	Salary Expense	1,500		(d)	120			1,620			
22	Rent Expense			(e)	1,600			1,600			
23	Supplies Expense			(b)	850			850			
24	Depreciation Expense			(c)	330			330			
25	Insurance Expense			(a)	300			300			
26	Miscellaneous Expense	450						450			
27		56,750	56,750		5,700		5,700	57,200	57,200		

EXHIBIT 12

End-of-Period Spreadsheet, Kelly Consulting

Adjusting Entries, Kelly Consulting

		Journal			Page 3
Date		Description	Post. Ref.	Debit	Credit
²⁰¹⁶ Apr.	30	Adjusting Entries Insurance Expense Prepaid Insurance Expired insurance.	55 16	300	300
	30	Supplies Expense Supplies Supplies used (\$2,200 – \$1,350).	53 14	850	850
	30	Depreciation Expense Accumulated Depreciation Depreciation of office equipment.	54 19	330	330
	30	Salary Expense Salaries Payable Accrued salary.	51 22	120	120
	30	Rent Expense Prepaid Rent Rent expired during April.	52 15	1,600	1,600
	30	Unearned Fees Fees Earned Fees earned (\$5,000 – \$2,500).	23 41	2,500	2,500

Step 6. Journalizing and Posting Adjusting Entries

Based on the adjustment data shown in Step 4, adjusting entries for Kelly Consulting are prepared as shown in Exhibit 13. Each adjusting entry affects at least one income statement account and one balance sheet account. Explanations for each adjustment including any computations are normally included with each adjusting entry.

Each of the adjusting entries shown in Exhibit 13 is posted to Kelly Consulting's ledger shown in Exhibit 18. The adjusting entries are identified in the ledger as "Adjusting."

Step 7. Preparing an Adjusted Trial Balance

After the adjustments have been journalized and posted, an adjusted trial balance is prepared to verify the equality of the total of the debit and credit balances. This is the last step before preparing the financial statements. If the adjusted trial balance does not balance, an error has occurred and must be found and corrected. The adjusted trial balance for Kelly Consulting as of April 30, 2016, is shown in Exhibit 14.

Step 8. Preparing the Financial Statements

The most important outcome of the accounting cycle is the financial statements. The income statement is prepared first, followed by the retained earnings statement and then the balance sheet. The statements can be prepared directly from the adjusted trial balance, the end-of-period spreadsheet, or the ledger. The net income or net loss shown on the income statement is reported on the retained earnings statement along with any dividends. The ending retained earnings is reported on the balance sheet with common stock as part of stockholders' equity. Stockholders' equity is then added with total liabilities to equal total assets.

The financial statements for Kelly Consulting are shown in Exhibit 15. Kelly Consulting earned net income of \$18,300 for April. As of April 30, 2016, Kelly Consulting has total assets of \$45,720, total liabilities of \$3,420, and total stockholders' equity of \$42,300.

Kelly Consulting Adjusted Trial Balance April 30, 2016 **Debit** Credit **Balances Balances** 22,100 3,400 Accounts Receivable 1,350 Prepaid Rent..... 3,200 Prepaid Insurance.... 1,500 Office Equipment 14,500 Accumulated Depreciation..... 330 Accounts Payable 800 Salaries Payable..... 120 2,500 Common Stock..... 30,000 Dividends 6,000 Fees Earned..... 23,450 1,620 Rent Expense 1,600 Supplies Expense..... 850 Depreciation Expense 330 Insurance Expense 300 Miscellaneous Expense 450 57,200 57,200

EXHIBIT 14

Adjusted Trial Balance, Kelly Consulting

Kelly Consulting Income Statement For the Month Ended April 30, 2016							
Fees earned		\$23,450					
Expenses:							
Salary expense	\$1,620						
Rent expense	1,600						
Supplies expense	850						
Depreciation expense	330						
Insurance expense	300						
Miscellaneous expense	450						
Total expenses		5,150					
Net income		\$18,300					

EXHIBIT 15

Financial Statements, Kelly Consulting

Kelly Consulting Retained Earnings Statement For the Month Ended April 30, 2016			
Retained earnings, April 1, 2016	\$ 18,300 6,000	\$	0
Increase in retained earnings		12,3 \$12,3	

(Continued)

Financial Statements, Kelly Consulting (Concluded)

Kelly Consulting Balance Sheet April 30, 2016								
Assets			Liabilities					
Current assets:			Current liabilities:					
Cash\$	22,100		Accounts payable \$ 800					
Accounts receivable	3,400		Salaries payable					
Supplies	1,350		Unearned fees					
Prepaid rent	3,200		Total liabilities	\$ 3,420				
Prepaid insurance	1,500							
Total current assets		\$31,550						
Property, plant, and equipment:			Stockholders' Equity					
Office equipment\$	14,500		Common stock					
Less accumulated depreciation	330		Retained earnings					
Total property, plant,			Total stockholders' equity	42,300				
and equipment		14,170	Total liabilities and					
Total assets		\$45,720	stockholders' equity	\$45,720				

Step 9. Journalizing and Posting Closing Entries

As described earlier in this chapter, four closing entries are required at the end of an accounting period. These four closing entries are as follows:

- 1. Debit each revenue account for its balance, and credit Income Summary for the total revenue.
- 2. Credit each expense account for its balance, and debit Income Summary for the total expenses.
- 3. Debit Income Summary for its balance, and credit the retained earnings account.
- 4. Debit the retained earnings account for the balance of the dividends account, and credit the dividends account.

The four closing entries for Kelly Consulting are shown in Exhibit 16. The closing entries are posted to Kelly Consulting's ledger as shown in Exhibit 18. After the closing entries are posted, Kelly Consulting's ledger has the following characteristics:

- The balance of Retained Earnings of \$12,300 agrees with the amount reported on the retained earnings statement and the balance sheet.
- The revenue, expense, and dividends accounts will have zero balances.

The closing entries are normally identified in the ledger as "Closing." In addition, a line is often inserted in both balance columns after a closing entry is posted. This separates next period's revenue, expense, and dividend transactions from those of the current period.

Step 10. Preparing a Post-Closing Trial Balance

A post-closing trial balance is prepared after the closing entries have been posted. The purpose of the post-closing trial balance is to verify that the ledger is in balance at the beginning of the next period. The accounts and amounts in the post-closing trial balance should agree exactly with the accounts and amounts listed on the balance sheet at the end of the period.

Journal							
Da	ate	Description	Post. Ref.	Debit	Credit		
2016		Closing Entries					
Apr		Fees Earned	41	23,450			
		Income Summary	34		23,450		
	30	Income Summary	34	5,150			
		Salary Expense	51		1,620		
		Rent Expense			1,600		
		Supplies Expense	53		850		
		Depreciation Expense	54		330		
		Insurance Expense	55		300		
		Miscellaneous Expense	59		450		
	30	Income Summary	34	18,300			
		Retained Earnings	32		18,300		
	30			6,000			
		Dividends	33		6,000		
	30	Retained Earnings Dividends	32 33	6,000	6,000		

Closing Entries, Kelly Consulting

The post-closing trial balance for Kelly Consulting is shown in Exhibit 17. The balances shown in the post-closing trial balance are taken from the ending balances in the ledger shown in Exhibit 18. These balances agree with the amounts shown on Kelly Consulting's balance sheet in Exhibit 15.

Kelly Consulting Post-Closing Trial Balance April 30, 2016						
	Debit Balances	Credit Balances				
Cash	22,100					
Accounts Receivable	3,400					
Supplies	1,350					
Prepaid Rent	3,200					
Prepaid Insurance	1,500					
Office Equipment	14,500					
Accumulated Depreciation		330				
Accounts Payable		800				
Salaries Payable		120				
Unearned Fees		2,500				
Common Stock		30,000				
Retained Earnings		12,300				
	46,050	46,050				

EXHIBIT 17

Post-Closing Trial Balance, Kelly Consulting

EXHIBIT 18 Ledger, K

Ledger, Kelly Consulting

Ledger									
Accou	ı nt Cash				Account	No. 11			
					Bala	nce			
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit			
2016		1	12 100		12.100				
Apr. 1		1	13,100	4 900	13,100				
2		1		4,800	8,300				
4		1	F 000	1,800	6,500				
			5,000		11,500				
6		1	1,800	420	13,300				
10		1		120	13,180				
12		1		1,200	11,980				
14		1		750	11,230				
17		2	6,250		17,480				
18		2		800	16,680				
24		2	3,850		20,530				
26		2	5,600		26,130				
27		2		750	25,380				
29		2		130	25,250				
30		2		200	25,050				
30		2	3,050		28,100				
30		2		6,000	22,100				

Accour	1t Accounts	Account No. 12				
		Doct			Bala	nce
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit
2016						
Apr. 1		1	3,000		3,000	
6		1		1,800	1,200	
12		1	4,200		5,400	
20		2	2,100		7,500	
26		2		5,600	1,900	
30		2	1,500		3,400	

Accou	i nt Supplies	Account No. 14				
		Post.			Balance	
Date	ltem	Ref.	Debit	Credit	Debit	Credit
2016						
Apr. 1		1	1,400		1,400	
18		2	800		2,200	
30	Adjusting	3		850	1,350	

Accou	I nt Prepaid R	Account No. 15				
		Post.			Bala	nce
Date	Item	Ref.	Debit	Credit	Debit	Credit
²⁰¹⁶ Apr. 1		1	4,800		4,800	
30	Adjusting	3	1,500	1,600	3,200	

Accou	int Prepaid Ii	Account No. 16					
		Post.			Bala	ance	
Date	Item	Ref.	Debit	Credit	Debit	Credit	
2016 Apr. 2		1	1,800		1,800		
Λρι. 2		'	1,000		1,000		
30	Adjusting	3		300	1,500		

Accou	i nt Office Equ		Account	No. 18		
					Bala	nce
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁶ Apr. 1		1	12,500		12,500	
5		1	2,000		14,500	

Accou	I nt Accumulo	Account No. 19				
					Bala	ince
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁶ Apr. 30	Adjusting	3		330		330

Accou	I nt Accounts	Account No. 21				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
2016 Apr. 5		1		2,000		2,000
12		1	1,200			800

Accou	int Salaries P	Account No. 22				
					Bala	nce
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁶ Apr. 30	Adjusting	3		120		120

Accou	int Unearned	Account No. 23					
					Bala	ance	
Date	ltem	Post. Ref.	Debit	Credit	Debit	Credit	
Apr. 4	A discontinuo	1	2.500	5,000		5,000	
30	Adjusting	3	2,500			2,500	

Accou	I nt Common	Account No. 31				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁶ Apr. 1		1		30,000		30,000

Accou	I nt Retained	Account No. 32				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁶ Apr. 1						0
30	Closing	4		18,300		18,300
30	Closing	4	6,000			12,300

Ledger, Kelly Consulting (Concluded)

Accou	I nt Dividend	Account No. 33				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁶ Apr. 30		2	6,000		6,000	
30	Closing	4		6,000	_	_

Αςςοι	int Rent Expe	Account No. 52				
					Bala	nce
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit
²⁰¹⁶ Apr. 30	Adjusting	3	1,600		1,600	
30	Closing	4		1,600	_	_

Accou	I nt Income S	Account No. 34						
					Bala	lance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit		
2016								
Apr. 30	Closing	4		23,450		23,450		
30	Closing	4	5,150			18,300		
30	Closing	4	18,300		_	_		

	Accou	I nt Supplies l	Account No. 53					
						Balance		
	Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
1	Apr. 30	Adjusting Closing	3 4	850	850	850 —	_	

Accou	I nt Fees Earn		Account No. 41				
					Bala	nce	
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2016							
Apr. 12		1		4,200		4,200	
17		2		6,250		10,450	
20		2		2,100		12,550	
24		2		3,850		16,400	
30		2		3,050		19,450	
30		2		1,500		20,950	
30	Adjusting	3		2,500		23,450	
30	Closing	4	23,450		_	_	

Acco	unt Deprecia	Account No. 54					
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
Apr. 30	, ,	3	330	330	330 —	_	

Account Salary Expense Account No. 51											
					Bala	nce					
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit					
²⁰¹⁶ Apr. 14		1	750		750						
27		2	750		1,500						
30	Adjusting	3	120		1,620						
30	Closing	4		1,620	_	_					

Accou	Account Insurance Expense Account No. 55										
					Bala	nce					
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit					
²⁰¹⁶ Apr. 30	Adjusting	3	300		300						
30	Closing	4		300	_	_					

Accou	ı nt Miscellan	Account No. 59					
					Balance		
Date	Item	Post. Ref.	Debit	Credit	Debit	Credit	
2016		1	120		120		
Apr. 10		'	120		120		
29		2	130		250		
30		2	200		450		
30	Closing	4		450	_	_	

Fiscal Year

The annual accounting period adopted by a business is known as its **fiscal year**. Fiscal years begin with the first day of the month selected and end on the last day of the following twelfth month. The period most commonly used is the calendar year. Other periods are not unusual, especially for businesses organized as corporations. For example, a corporation may adopt a fiscal year that ends when business activities have



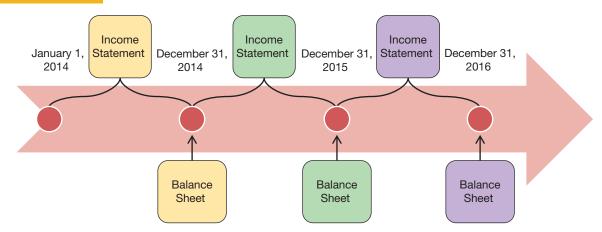
reached the lowest point in its annual operating cycle. Such a fiscal year is called the natural business year. At the low point in its operating cycle, a business has more time to analyze the results of operations and to prepare financial statements.

Because companies with fiscal years often have highly seasonal operations, investors and others should be careful in interpreting partial-year reports for such companies. That is, you should expect the results of operations for these companies to vary significantly throughout the fiscal year.

The financial history of a business may be shown by a series of balance sheets and income statements for several fiscal years. If the life of a business is expressed by a line moving from left to right, the series of balance sheets and income statements may be graphed as shown in Exhibit 19.

EXHIBIT 19

Financial History of a Business





Business **Connection**

CHOOSING A FISCAL YEAR

CVS Caremark Corporation (CVS) operates more than 7,000 pharmacies throughout the United States and fills more than one billion prescriptions annually. CVS recently chose December 31 as its fiscal year-end and described its decision as follows:

.... our Board of Directors approved a change in our fiscal year-end ... to December 31 of each year to better reflect our position in the health care ... industry.

In contrast, most large retailers such as Walmart and Target use fiscal years ending January 31, when their operations are the slowest following the December holidays.

Describe and illustrate the use of working capital and the current ratio in evaluating a company's financial condition.



Financial Analysis and Interpretation: Working Capital and Current Ratio

The ability to convert assets into cash is called **liquidity**, while the ability of a business to pay its debts is called solvency. Two financial measures for evaluating a business's short-term liquidity and solvency are working capital and the current ratio.

Working capital is the excess of the current assets of a business over its current liabilities, computed as follows:

Working Capital = Current Assets - Current Liabilities

Current assets are more liquid than long-term assets. Thus, an increase in a company's current assets increases or improves its liquidity. An increase in working capital increases or improves liquidity in the sense that current assets are available for uses other than paying current liabilities.

A positive working capital implies that the business is able to pay its current liabilities and is solvent. Thus, an increase in working capital increases or improves a company's short-term solvency.

To illustrate, **NetSolutions**' working capital at the end of 2015 is \$6,355 computed as follows:

This amount of working capital implies that NetSolutions is able to pay its current liabilities.

The **current ratio** is another means of expressing the relationship between current assets and current liabilities. The current ratio is computed by dividing current assets by current liabilities, as follows:

$$Current Ratio = \frac{Current Assets}{Current Liabilities}$$

To illustrate, the current ratio for **NetSolutions** at the end of 2015 is 5.6, computed as follows:

Current Ratio =
$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$
$$= \frac{57,745}{$1,390}$$
$$= 5.6 \text{ (Rounded)}$$

The current ratio is more useful than working capital in making comparisons across companies or with industry averages. To illustrate, the following data (in millions) were taken from recent financial statements of Electronic Arts Inc., Take-Two Interactive Software, Inc., and Zynga, Inc.:

	Electro	nic Arts	Take	-Two	Zynga		
	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	
Current assets	\$2,609	\$3,032	\$744	\$567	\$1,484	\$2,024	
Current liabilities	2,120	2,001	219	_231	509	669	
Working capital Current ratio*	\$ 489 1.23	\$1,031 1.52	\$525 3.40	\$336 2.45	\$ 975 2.92	\$1,355 3.03	

(\$2,609 ÷ \$2,120) (\$3,032 ÷ \$2,001) (\$744 ÷ \$219) (\$567 ÷ \$231) (\$1,484 ÷ \$509) (\$2,024 ÷ \$669)

Electronic Arts has more than 3.5 times (\$2,609 compared to \$744) the current assets as does Take-Two and more than 1.7 times (\$2,609 compared to \$1,484) the current assets of Zynga. Such size differences makes meaningful comparisons difficult across companies. For this reason, ratios, such as the current ratio, are computed.

Although Electronic Arts is larger, Take-Two and Zynga have higher current ratios (3.40 and 2.45 for Take-Two; 2.92 and 3.03 for Zynga) than Electronic Arts. Overall, Take-Two and Zynga appear to be in a stronger short-term liquidity position than Electronic Arts. In addition, Electronics Arts' current ratio has decreased to 1.23 from 1.52, while Take-Two's current ratio has increased to 3.40 from 2.45 and Zynga's current ratio has decreased slightly to 2.92 from 3.03.

^{*} Rounded to two decimal places.

Example Exercise 4-6 Working Capital and Current Ratio

OBJ 7

Current assets and current liabilities for Fortson Company follow:

 Current assets
 \$310,500
 \$262,500

 Current liabilities
 172,500
 150,000

- a. Determine the working capital and current ratio for 2016 and 2015.
- b. Does the change in the current ratio from 2015 to 2016 indicate a favorable or an unfavorable trend?

Follow My Example 4-6

a.		
	2016	2015
Current assets	\$310,500	\$262,500
Current liabilities	_172,500	_150,000
Working capital	\$138,000	\$112,500
Current ratio	1.80	1.75
	(\$310,500 ÷ \$172,500)	(\$262,500 ÷ \$150,000)

b. The change from 1.75 to 1.80 indicates a favorable trend.

Practice Exercises: PE 4-6A, PE 4-6B

A P P E N D I X

End-of-Period Spreadsheet

Accountants often use spreadsheets for analyzing and summarizing data. Such spreadsheets are not a formal part of the accounting records. This is in contrast to the chart of accounts, the journal, and the ledger, which are essential parts of an accounting system. Spreadsheets are usually prepared by using a computer program such as Microsoft's Excel.®

Exhibit 1 is an end-of-period spreadsheet used to summarize adjusting entries and their effects on the accounts. As illustrated in the chapter, the financial statements for NetSolutions can be prepared directly from the spreadsheet's Adjusted Trial Balance columns.

Some accountants prefer to expand the end-of-period spreadsheet shown in Exhibit 1 to include financial statement columns. Exhibits 20 through 24 illustrate the step-by-step process of how to prepare this expanded spreadsheet. As a basis for illustration, **NetSolutions** is used.

Step 1. Enter the Title

The spreadsheet is started by entering the following data:

- 1. Name of the business: NetSolutions
- 2. Type of spreadsheet: End-of-Period Spreadsheet
- 3. The period of time: For the Two Months Ended December 31, 2015

Exhibit 20 shows the preceding data entered for NetSolutions.

Spreadsheet with Unadjusted Trial Balance Entered

	А	В	С	D	E	F	G	Н		J	K
1					etSolution						
2					eriod Spr						
3				wo Month	s Ended I						
4		Unadj									
5		Trial Ba	alance	Adjus	tments	Income	Statement	Balance Sheet			
6	Account Title	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
7											
8	Cash	2,065									
9	Accounts Receivable	2,220									
10	Supplies	2,000									
11	Prepaid Insurance	2,400							The spread	sheet is us	ed for
	Land	20,000							summarizin		
	Office Equipment	1,800							adjusting entries. It also aids		
	Accumulated Depreciation								in preparing		
	Accounts Payable		900						statements.		
	Wages Payable							L			
17	Unearned Rent		360								
	Common Stock		25,000								
	Dividends	4,000									
_	Fees Earned		16,340								
21	Rent Revenue										
22	Wages Expense	4,275									
		800									
	Rent Expense	1,600									
25	Utilities Expense	985									
26	Insurance Expense										
27	Depreciation Expense										
28	Miscellaneous Expense	455									
29		<u>42,600</u>	42,600								

Step 2. Enter the Unadjusted Trial Balance

Enter the unadjusted trial balance on the spreadsheet. The spreadsheet in Exhibit 20 shows the unadjusted trial balance for NetSolutions at December 31, 2015.

Step 3. Enter the Adjustments

The adjustments for NetSolutions from Chapter 3 are entered in the Adjustments columns, as shown in Exhibit 21. Cross-referencing (by letters) the debit and credit of each adjustment is useful in reviewing the spreadsheet. It is also helpful for identifying the adjusting entries that need to be recorded in the journal. This cross-referencing process is sometimes referred to as *keying* the adjustments.

The adjustments are normally entered in the order in which the data are assembled. If the titles of the accounts to be adjusted do not appear in the unadjusted trial balance, the accounts are inserted in their proper order in the Account Title column.

The adjusting entries for NetSolutions that are entered in the Adjustments columns are as follows:

- (a) **Supplies.** The supplies account has a debit balance of \$2,000. The cost of the supplies on hand at the end of the period is \$760. The supplies expense for December is the difference between the two amounts, or \$1,240 (\$2,000 \$760). The adjustment is entered as (1) \$1,240 in the Adjustments Debit column on the same line as Supplies Expense and (2) \$1,240 in the Adjustments Credit column on the same line as Supplies.
- (b) **Prepaid Insurance.** The prepaid insurance account has a debit balance of \$2,400. This balance represents the prepayment of insurance for 12 months beginning December 1. Thus, the insurance expense for December is \$200 (\$2,400 ÷ 12). The adjustment is entered as (1) \$200 in the Adjustments Debit column on the same line as Insurance Expense and (2) \$200 in the Adjustments Credit column on the same line as Prepaid Insurance.

Spreadsheet with Unadjusted Trial Balance and Adjustments

	А	В	С		D		Е	F	G		Н		J	K
1					N	etS	olution	S						
2				End	d-of-P	eric	d Spre	eadsheet	t					
3			For the T	wo I	Month	s E	nded D	ecembe	r 31, 20	015				
4		Unadji	usted					Adj	usted					
5		Trial Ba	alance		Adjus	tme	nts	Trial	Balance	9	Income S	Statement	Baland	e Sheet
6	Account Title	Dr.	Cr.	ı	Dr.		Cr.	Dr.	Cı	r.	Dr.	Cr.	Dr.	Cr.
7														
8	Cash	2,065												
9	Accounts Receivable	2,220		(d)	500									
10	Supplies	2,000				(a)	1,240				ne adjustme			et are
11	Prepaid Insurance	2,400				(b)	200				ed in prepa		justing	
12		20,000								jοι	urnal entries	S.		
13	Office Equipment	1,800												
14	Accumulated Depreciation					(f)	50							
15	Accounts Payable		900											
16	Wages Payable					(e)	250							
17	Unearned Rent		360	(c)	120									
18	Common Stock		25,000											
19	Dividends	4,000												
20	Fees Earned		16,340			(d)	500							
21	Rent Revenue					(c)	120							
22	Wages Expense	4,275		(e)	250									
23	Supplies Expense	800		(a)	1,240									
24	Rent Expense	1,600												
25	Utilities Expense	985												
26	Insurance Expense			(b)	200									
27	Depreciation Expense			(f)	50									
28	Miscellaneous Expense	455												
29		<u>42,600</u>	42,600		2,360		2,360							

- (c) **Unearned Rent.** The unearned rent account has a credit balance of \$360. This balance represents the receipt of three months' rent, beginning with December. Thus, the rent revenue for December is \$120 (\$360 ÷ 3). The adjustment is entered as (1) \$120 in the Adjustments Debit column on the same line as Unearned Rent and (2) \$120 in the Adjustments Credit column on the same line as Rent Revenue.
- (d) **Accrued Fees.** Fees accrued at the end of December but not recorded total \$500. This amount is an increase in an asset and an increase in revenue. The adjustment is entered as (1) \$500 in the Adjustments Debit column on the same line as Accounts Receivable and (2) \$500 in the Adjustments Credit column on the same line as Fees Earned.
- (e) Wages. Wages accrued but not paid at the end of December total \$250. This amount is an increase in expenses and an increase in liabilities. The adjustment is entered as (1) \$250 in the Adjustments Debit column on the same line as Wages Expense and (2) \$250 in the Adjustments Credit column on the same line as Wages Payable.
- (f) **Depreciation.** Depreciation of the office equipment is \$50 for December. The adjustment is entered as (1) \$50 in the Adjustments Debit column on the same line as Depreciation Expense and (2) \$50 in the Adjustments Credit column on the same line as Accumulated Depreciation.

After the adjustments have been entered, the Adjustments columns are totaled to verify the equality of the debits and credits. The total of the Debit column must equal the total of the Credit column.

Step 4. Enter the Adjusted Trial Balance

The adjusted trial balance is entered by combining the adjustments with the unadjusted balances for each account. The adjusted amounts are then extended to the Adjusted Trial Balance columns, as shown in Exhibit 22.

To illustrate, the cash amount of \$2,065 is extended to the Adjusted Trial Balance Debit column since no adjustments affected Cash. Accounts Receivable has an initial

Spreadsheet with Unadjusted Trial Balance, Adjustments, and Adjusted Trial Balance Entered

	А	В	С		D		Е	F	G	Н	I	J	K
1					N	etS	olution	s					
2			End-of-Period Spreadsheet										
3			For the Two Months Ended Decemb						31, 2015				
4		Unadj						Adjusted					
5		Trial B	alance	Adjustments			nts	Trial Balance		Income Statement		Balance Sheet	
6	Account Title	Dr.	Cr.	1	Dr.		Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
7													
8	Cash	2,065						2,065					
9	Accounts Receivable	2,220		(d)	500			2,720					
10	Supplies	2,000				(a)	1,240	760					
11	Prepaid Insurance	2,400				(b)	200	2,200					
12	Land	20,000						20,000					
13	Office Equipment	1,800						1,800					
14	Accumulated Depreciation					(f)	50		50				
15	Accounts Payable		900						900				
16	Wages Payable					(e)	250		250				
17	Unearned Rent		360	(c)	120				240				
18	Common Stock		25,000						25,000				
19	Dividends	4,000						4,000					
20	Fees Earned		16,340			(d)	500		16,840				
21	Rent Revenue					(c)	120		120				
22	Wages Expense	4,275		(e)	250			4,525					
23	Supplies Expense	800		(a)	1,240			2,040					
24	Rent Expense	1,600		,				1,600					
25	Utilities Expense	985						985					
26	Insurance Expense			(b)	200			200					
27	Depreciation Expense			(f)	50			50					
28	Miscellaneous Expense	455						455					
29	·	42,600	42,600		2,360		2,360	43,400	43,400				
								A					

The adjusted trial balance amounts are determined by adding the adjustments to or subtracting the adjustments from the trial balance amounts. For example, the Wages Expense debit of \$4,525 is the trial balance amount of \$4,275 plus the \$250 adjustment debit.

balance of \$2,220 and a debit adjustment of \$500. Thus, \$2,720 (\$2,220 + \$500) is entered in the Adjusted Trial Balance Debit column for Accounts Receivable. The same process continues until all account balances are extended to the Adjusted Trial Balance columns.

After the accounts and adjustments have been extended, the Adjusted Trial Balance columns are totaled to verify the equality of debits and credits. The total of the Debit column must equal the total of the Credit column.

Step 5. Extend the Accounts to the Income Statement and Balance Sheet Columns

The adjusted trial balance amounts are extended to the Income Statement and Balance Sheet columns. The amounts for revenues and expenses are extended to the Income Statement columns. The amounts for assets, liabilities, and stockholders' equity (Common Stock, Retained Earnings, Dividends) are extended to the Balance Sheet columns.³

The first account listed in the Adjusted Trial Balance columns is Cash with a debit balance of \$2,065. Cash is an asset, is listed on the balance sheet, and has a debit balance. Therefore, \$2,065 is extended to the Balance Sheet Debit column. The Fees Earned balance of \$16,840 is extended to the Income Statement Credit column. The

³ The balance of the dividends account is extended to the Balance Sheet columns because the spreadsheet does not have separate Retained Earnings Statement columns.

Spreadsheet with Amounts Extended to Income Statement and Balance Sheet Columns

	A	В	С		D		Е	F	G	Н	Ī	J	K	
1			NetSolutions											
2			End-of-Period Spreadsheet											
3			For the T	wo I	Month	s Er								
4		Unadj						Adjusted						
5		Trial Ba	alance	Adjust			nts	Trial Balance		Income Statement		Balance Sheet		
6	Account Title	Dr.	Cr.		Dr.		Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	
7														
	Cash	2,065						2,065				2,065		
9	Accounts Receivable	2,220		(d)	500			2,720				2,720		
10	Supplies	2,000				(a)	1,240	760				760		
11	Prepaid Insurance	2,400				(b)	200	2,200				2,200		
	Land	20,000						20,000				20,000		
	Office Equipment	1,800						1,800				1,800		
	Accumulated Depreciation					(f)	50		50				50	
	Accounts Payable		900						900				900	
16	Wages Payable					(e)	250		250				250	
17	Unearned Rent		360	(c)	120				240				240	
	Common Stock		25,000						25,000				25,000	
	Dividends	4,000						4,000				4,000		
_	Fees Earned		16,340			(d)	500		16,840		16,840			
21	Rent Revenue					(c)	120		120		120			
	Wages Expense	4,275		(e)	250			4,525		4,525				
	Supplies Expense	800		(a)	1,240			2,040		2,040				
	Rent Expense	1,600						1,600		1,600				
	Utilities Expense	985						985		985				
26	Insurance Expense			(b)	200			200		200				
27	Depreciation Expense			(f)	50			50		50				
	Miscellaneous Expense	455				_		<u>455</u>		455				
29		<u>42,600</u>	42,600	_	2,360		2,360	<u>43,400</u>	<u>43,400</u>					
										^	^	^	^	
										The rever	nue	The asse	t, liability,	
										and expe			stock, and	
										amounts			amounts	
									extended to		extended to (entere			
										(entered in)		in) the Balance She		
										the Income columns				
										Statemer	nt			
										columns.				

same process continues until all account balances have been extended to the proper columns, as shown in Exhibit 23.

Step 6. Total the Income Statement and Balance Sheet Columns, Compute the Net Income or Net Loss, and Complete the Spreadsheet

After the account balances are extended to the Income Statement and Balance Sheet columns, each of the columns is totaled. The difference between the two Income Statement column totals is the amount of the net income or the net loss for the period. This difference (net income or net loss) will also be the difference between the two Balance Sheet column totals.

If the Income Statement Credit column total (total revenue) is greater than the Income Statement Debit column total (total expenses), the difference is the net income. If the Income Statement Debit column total is greater than the Income Statement Credit column total, the difference is a net loss.

As shown in Exhibit 24, the total of the Income Statement Credit column is \$16,960, and the total of the Income Statement Debit column is \$9,855. Thus, the net income for NetSolutions is \$7,105, computed as follows:

Total of Income Statement Credit column (revenues)\$16,960Total of Income Statement Debit column (expenses)9,855Net income (excess of revenues over expenses)\$7,105

The amount of the net income, \$7,105, is entered in the Income Statement Debit column and the Balance Sheet Credit column. *Net income* is also entered in the Account Title column. Entering the net income of \$7,105 in the Balance Sheet Credit column has the effect of transferring the net balance of the revenue and expense accounts to the retained earnings account.

If there was a net loss instead of net income, the amount of the net loss would be entered in the Income Statement Credit column and the Balance Sheet Debit column. *Net loss* would also be entered in the Account Title column.

EXHIBIT 24

Completed Spreadsheet with Net Income Shown

	А	В	С	D)		E	F	G	Н	I	J	K
1			NetSolutions										
2				End-	of-P	erio	d Spre	adsheet					
3			For the T	wo M	onth	s En	ided D	ecember	31, 2015				
4		Unadj	usted					Adju	sted				
5		Trial B	alance	Α	djust	men	ts	Trial B	alance	Income S	tatement	Balance	Sheet
6	Account Title	Dr.	Cr.	Dr	r.	(Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
7					Ť								
8	Cash	2,065						2,065				2,065	
9	Accounts Receivable	2,220		(d)	500			2,720				2,720	
10	Supplies	2,000				(a)	1,240	760				760	
11	Prepaid Insurance	2,400				(b)	200	2,200				2,200	
12	Land	20,000						20,000				20,000	
13	Office Equipment	1,800						1,800				1,800	
14	Accumulated Depreciation					(f)	50		50				50
15	Accounts Payable		900						900				900
16	Wages Payable					(e)	250		250				250
17	Unearned Rent		360	(c)	120				240				240
18	Common Stock		25,000						25,000				25,000
19	Dividends	4,000						4,000				4,000	
20	Fees Earned		16,340			(d)	500		16,840		16,840		
21	Rent Revenue					(c)	120		120		120		
22	Wages Expense	4,275		(e)	250			4,525		4,525			
23	Supplies Expense	800		(a) 1	,240			2,040		2,040			
24	Rent Expense	1,600						1,600		1,600			
25	Utilities Expense	985						985		985			
26	Insurance Expense			(b)	200			200		200			
27	Depreciation Expense			(f)	50			50		50			
28	Miscellaneous Expense	455						455		455			
29		<u>42,600</u>	<u>42,600</u>	2	,360		2,360	43,400	43,400	9,855	16,960	33,545	26,440
30	Net income									7,105			<u>7,105</u>
31										<u>16,960</u>	<u>16,960</u>	33,545	33,545

The difference between the Income Statement column totals is the net income (or net loss) for the period. The difference between the Balance Sheet column totals is also the net income (or net loss) for the period.

After the net income or net loss is entered on the spreadsheet, the Income Statement and Balance Sheet columns are totaled. The totals of the two Income Statement columns must now be equal. The totals of the two Balance Sheet columns must also be equal.

Preparing the Financial Statements from the Spreadsheet

The spreadsheet can be used to prepare the income statement, the retained earnings statement, and the balance sheet shown in Exhibit 2. The income statement is normally prepared directly from the spreadsheet. The expenses are listed in the income statement in Exhibit 2 in order of size, beginning with the larger items. Miscellaneous expense is the last item, regardless of its amount.

The first item normally presented on the retained earnings statement is the balance of the retained earnings account at the beginning of the period. This amount along with the net income (or net loss) and the dividends amount shown in the spreadsheet are used to determine the ending retained earnings account balance.

The balance sheet can be prepared directly from the spreadsheet columns except for the ending balance of retained earnings. The ending balance of retained earnings is taken from the retained earnings statement.

When a spreadsheet is used, the adjusting and closing entries are normally not journalized or posted until after the spreadsheet and financial statements have been prepared. The data for the adjusting entries are taken from the Adjustments columns of the spreadsheet. The data for the first two closing entries are taken from the Income Statement columns of the spreadsheet. The amount for the third closing entry is the net income or net loss appearing at the bottom of the spreadsheet. The amount for the fourth closing entry is the dividends account balance that appears in the Balance Sheet Debit column of the spreadsheet.

At a Glance 4



Describe the flow of accounting information from the unadjusted trial balance into the adjusted trial balance and financial statements.

Key Points Exhibit 1 illustrates the end-of-period process by which accounts are adjusted and how the adjusted accounts flow into the financial statements.

Learning Outcomes	Example Exercises	Practice Exercises
• Using an end-of-period spreadsheet, describe how the unadjusted trial balance accounts are affected by adjustments and how the adjusted trial balance accounts flow into the income statement and balance sheet.		PE4-1A, 4-1B



Prepare financial statements from adjusted account balances.

Key Points Using the end-of-period spreadsheet shown in Exhibit 1, the income statement, retained earnings statement, and balance sheet can be prepared. A classified balance sheet has sections for current assets; property, plant, and equipment; current liabilities; long-term liabilities; and stockholders' equity.

Learning Outcomes	Example Exercises	Practice Exercises	
 Describe how the net income or net loss from the period can be determined from an end-of-period spreadsheet. 			
 Prepare an income statement, a retained earnings statement, and a balance sheet. 	EE4-2	PE4-2A, 4-2B	
• Indicate how accounts would be reported on a classified balance sheet.	EE4-3	PE4-3A, 4-3B	



Prepare closing entries.

Key Points Four entries are required in closing the temporary accounts. The first entry closes the revenue accounts to Income Summary. The second entry closes the expense accounts to Income Summary. The third entry closes the balance of Income Summary (net income or net loss) to the retained earnings account. The fourth entry closes the dividends account to the retained earnings account.

After the closing entries have been posted to the ledger, the balance in the retained earnings account agrees with the amount reported on the retained earnings statement and balance sheet. In addition, the revenue, expense, and dividends accounts will have zero balances.

Learning Outcomes	Example Exercises	Practice Exercises
 Prepare the closing entry for revenues. 	EE4-4	PE4-4A, 4-4B
 Prepare the closing entry for expenses. 	EE4-4	PE4-4A, 4-4B
 Prepare the closing entry for transferring the balance of Income Summary to the retained earnings account. 	EE4-4	PE4-4A, 4-4B
 Prepare the closing entry for the dividends account. 	EE4-4	PE4-4A, 4-4B



Describe the accounting cycle.

Key Points The 10 basic steps of the accounting cycle are as follows:

- 1. Transactions are analyzed and recorded in the journal.
- 2. Transactions are posted to the ledger.
- 3. An unadjusted trial balance is prepared.
- 4. Adjustment data are assembled and analyzed.
- 5. An optional end-of-period spreadsheet is prepared.
- 6. Adjusting entries are journalized and posted to the ledger.
- 7. An adjusted trial balance is prepared.
- 8. Financial statements are prepared.
- 9. Closing entries are journalized and posted to the ledger.
- 10. A post-closing trial balance is prepared.

Learning Outcomes	Example Exercises	Practice Exercises
• List the 10 steps of the accounting cycle.	EE4-5	PE4-5A, 4-5B
 Determine whether any steps are out of order in a listing of accounting cycle steps. 		
 Determine whether there are any missing steps in a listing of accounting cycle steps. 		



Illustrate the accounting cycle for one period.

Key Points The complete accounting cycle for Kelly Consulting for the month of April is described and illustrated in this chapter.

Learning Outcomes

 Complete the accounting cycle for a period from beginning to end. Example Exercises Practice Exercises



Explain what is meant by the fiscal year and the natural business year.

Key Points The annual accounting period adopted by a business is its fiscal year. A company's fiscal year that ends when business activities have reached the lowest point in its annual operating cycle is called the natural business year.

Learning Outcomes	Example Exercises	Practice Exercises
• Explain why companies use a fiscal year that is different from the		
calendar year.		



Describe and illustrate the use of working capital and the current ratio in evaluating a company's financial condition.

Key Points The ability to convert assets into cash is called liquidity, while the ability of a business to pay its debts is called solvency. Two financial measures for evaluating a business's short-term liquidity and solvency are working capital and the current ratio. Working capital is computed by subtracting current liabilities from current assets. An excess of current assets over current liabilities implies that the business is able to pay its current liabilities. The current ratio is computed by dividing current assets by current liabilities. The current ratio is more useful than working capital in making comparisons across companies or with industry averages.

Learning Outcomes	Example Exercises	Practice Exercises
Define liquidity and solvency.		
Compute working capital.	EE4-6	PE4-6A, 4-6B
Compute the current ratio.	EE4-6	PE4-6A, 4-6B

Key Terms

accounting cycle (164) clearing account (159) closing entries (159) closing process (159) closing the books (159) current assets (157) current liabilities (157)

current ratio (177) fiscal year (175) fixed (plant) assets (157) Income Summary (159) liquidity (176) long-term liabilities (157) natural business year (176) notes receivable (157) real (permanent) accounts (158) solvency (176) temporary (nominal) accounts (158) working capital (176)

Illustrative Problem

Three years ago, T. Roderick organized Harbor Realty. At July 31, 2016, the end of the fiscal year, the following end-of-period spreadsheet was prepared:

	А	В	С	D	Е	F	G
1		Harbor Realty End-of-Period Spreadsheet					
2							
3	Fo	16					
4		Unadjı	ısted			Adjus	
5		Trial Ba	alance		tments	Trial Ba	alance
6	Account Title	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
7							
8	Cash	3,425				3,425	
9	Accounts Receivable	7,000		(e) 1,000		8,000	
10	Supplies	1,270			(a) 890	380	
11	Prepaid Insurance	620			(b) 315	305	
12	Office Equipment	51,650				51,650	
13	Accum. Depreciation		9,700		(c) 4,950		14,650
14	Accounts Payable		925				925
15	Unearned Fees		1,250	(f) 500			750
16	Wages Payable				(d) 440		440
17	Common Stock		5,000				5,000
18	Retained Earnings		24,000				24,000
19	Dividends	5,200				5,200	
20	Fees Earned		59,125		(e) 1,000		60,625
21					(f) 500		
22	Wages Expense	22,415		(d) 440		22,855	
23	Depreciation Expense			(c) 4,950		4,950	
24	Rent Expense	4,200				4,200	
25	Utilities Expense	2,715				2,715	
26	Supplies Expense			(a) 890		890	
27	Insurance Expense			(b) 315		315	
28	Miscellaneous Expense	1,505				1,505	
29		100,000	100,000	8,095	8,095	106,390	106,390

Instructions

- 1. Prepare an income statement, a retained earnings statement and a balance sheet.
- 2. On the basis of the data in the end-of-period spreadsheet, journalize the closing entries.

Solution

1.

Harbor Realty Income Statement For the Year Ended July 31, 2016		
Fees earned.		\$60,625
Expenses:		
Wages expense	\$22,855	
Depreciation expense	4,950	
Rent expense	4,200	
Utilities expense	2,715	
Supplies expense	890	
Insurance expense	315	
Miscellaneous expense	1,505	
Total expenses		37,430
Net income		<u>\$23,195</u>

Harbor Realty Retained Earnings Statement For the Year Ended July 31, 2016	
Retained earnings, August 1, 2015	\$24,000
Increase in retained earnings	17,995 \$41,995

Harbor Realty Balance Sheet July 31, 2016						
Assets		Liabilities				
Current assets: Cash	8,000 380 305 \$51,650	Unearned fees				

Journal								
Date		Description	Post. Ref.	Debit	Credit			
²⁰¹⁶ July	31	Closing Entries Fees Earned Income Summary Income Summary Wages Expense Depreciation Expense Rent Expense Utilities Expense Supplies Expense Insurance Expense Miscellaneous Expense		60,625 37,430	22,855 4,950 4,200 2,715 890 315 1,505			
	31	Income Summary Retained Earnings		23,195	23,195			
	31	Retained Earnings Dividends		5,200	5,200			

Discussion Questions

- 1. Why do some accountants prepare an end-of-period spreadsheet?
- 2. Describe the nature of the assets that compose the following sections of a balance sheet: (a) current assets, (b) property, plant, and equipment.
- 3. What is the difference between a current liability and a long-term liability?
- 4. What types of accounts are referred to as temporary accounts?
- 5. Why are closing entries required at the end of an accounting period?
- 6. What is the difference between adjusting entries and closing entries?
- 7. What is the purpose of the post-closing trial balance?
- 8. (a) What is the most important output of the accounting cycle? (b) Do all companies have an accounting cycle? Explain.

9. What is the natural business year?



Recent fiscal years for several well-known companies are as follows:

Company	Fiscal Year Ending
JCPenney	January 27
Limited Brands, Inc.	January 27
Sears	January 27
Target Corp.	January 27
Home Depot	January 28
Tiffany & Co.	January 30

What general characteristic shared by these companies explains why they do not have fiscal years ending December 31?

Practice Exercises

FE 4-1 n 154

PE 4-1A Flow of accounts into financial statements

OBJ. 1

The balances for the accounts that follow appear in the Adjusted Trial Balance columns of the end-of-period spreadsheet. Indicate whether each account would flow into the income statement, retained earnings statement, or balance sheet.

1. Accounts Receivable

- 5. Rent Revenue
- 2. Depreciation Expense—Equipment
- 6. Supplies Expense

3. Retained Earnings

7. Unearned Revenue

4. Office Equipment

8. Wages Payable

EE 4-1 p. 154

PE 4-1B Flow of accounts into financial statements

OBJ. 1

The balances for the accounts that follow appear in the Adjusted Trial Balance columns of the end-of-period spreadsheet. Indicate whether each account would flow into the income statement, retained earnings statement, or balance sheet.

- 1. Accumulated Depreciation—Building
- 5. Prepaid Rent

2. Cash

6. Supplies

3. Fees Earned

7. Dividends

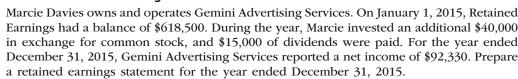
4. Insurance Expense

8. Wages Expense



PE 4-2A Retained earnings statement

OBJ. 2





EE 4-2 p. 156 PE 4-2B Retained earnings statement

OBJ. 2

Blake Knudson owns and operates Grab Bag Delivery Services. On January 1, 2015, Retained Earnings had a balance of \$918,000. During the year, no additional common stock was issued, and \$15,000 of dividends were paid. For the year ended December 31, 2015, Grab Bag Delivery Services reported a net loss of \$43,500. Prepare a retained earnings statement for the year ended December 31, 2015.



EE 4-3 p. 158 PE 4-3A Classified balance sheet

OBJ. 2

The following accounts appear in an adjusted trial balance of San Jose Consulting. Indicate whether each account would be reported in the (a) current asset; (b) property, plant, and equipment; (c) current liability; (d) long-term liability; or (e) stockholders' equity section of the December 31, 2015, balance sheet of San Jose Consulting.

1. Building

5. Salaries Payable

2. Common Stock

- 6. Supplies
- 3. Notes Payable (due in five years)
- 7. Taxes Payable

4 Duamaid Dant

7. Tunes Tuyusie

4. Prepaid Rent

8. Unearned Service Fees



EE 4-3 *p. 158*

PE 4-3B Classified balance sheet

OBJ. 2



The following accounts appear in an adjusted trial balance of Kangaroo Consulting. Indicate whether each account would be reported in the (a) current asset; (b) property, plant, and equipment; (c) current liability; (d) long-term liability; or (e) stockholders' equity section of the December 31, 2015, balance sheet of Kangaroo Consulting.

1. Accounts Payable

5. Common Stock

2. Accounts Receivable

- 6. Note Payable (due in ten years)
- 3. Accumulated Depreciation—Building
- 7. Supplies

4. Cash

8. Wages Payable

EE 4-4 p. 161

PE 4-4A Closing entries

OBJ. 3

After the accounts have been adjusted at October 31, the end of the fiscal year, the following balances were taken from the ledger of Smart Delivery Services Co.:

Retained Earnings	\$3,550,000
Dividends	40,000
Fees Earned	1,145,000
Wages Expense	740,000
Rent Expense	65,000
Supplies Expense	14,750
Miscellaneous Expense	8,800

Journalize the four entries required to close the accounts.

EE 4-4 p. 161

PE 4-4B Closing entries

OBJ. 3

After the accounts have been adjusted at April 30, the end of the fiscal year, the following balances were taken from the ledger of Nuclear Landscaping Co.:

\$643,600
10,500
356,500
283,100
56,000
11,500
13,000

Journalize the four entries required to close the accounts.

EE 4-5 p. 164

PE 4-5A Accounting cycle

OBJ. 4

From the following list of steps in the accounting cycle, identify what two steps are missing:

- a. Transactions are analyzed and recorded in the journal.
- b. An unadjusted trial balance is prepared.
- c. Adjustment data are assembled and analyzed.
- d. An optional end-of-period spreadsheet is prepared.
- e. Adjusting entries are journalized and posted to the ledger.
- f. An adjusted trial balance is prepared.
- g. Closing entries are journalized and posted to the ledger.
- h. A post-closing trial balance is prepared.

EE 4-5 p. 164

PE 4-5B Accounting cycle

OBJ. 4

From the following list of steps in the accounting cycle, identify what two steps are missing:

- a. Transactions are analyzed and recorded in the journal.
- b. Transactions are posted to the ledger.
- c. An unadjusted trial balance is prepared.

(Continued)



- d. An optional end-of-period spreadsheet is prepared.
- e. Adjusting entries are journalized and posted to the ledger.
- f. An adjusted trial balance is prepared.
- g. Financial statements are prepared.
- h. A post-closing trial balance is prepared.

EE 4-6 p. 178

PE 4-6A Working capital and current ratio

OBJ. 7





Balance sheet data for HQ Properties Company follows:

2016
2015

	2016	2015
Current assets	\$2,175,000	\$1,900,000
Current liabilities	1,500,000	1,250,000

- a. Determine the working capital and current ratio for 2016 and 2015.
- b. Does the change in the current ratio from 2015 to 2016 indicate a favorable or an unfavorable trend?

EE 4-6 *p. 178*

PE 4-6B Working capital and current ratio

OBJ. 7





Balance sheet data for Brimstone Company follows: 2016 2015

 Current assets
 \$1,586,250
 \$1,210,000

 Current liabilities
 705,000
 550,000

- a. Determine the working capital and current ratio for 2016 and 2015.
- b. Does the change in the current ratio from 2015 to 2016 indicate a favorable or an unfavorable trend?

Exercises

EX 4-1 Flow of accounts into financial statements

OBJ. 1, 2

The balances for the accounts that follow appear in the Adjusted Trial Balance columns of the end-of-period spreadsheet. Indicate whether each account would flow into the income statement, retained earnings statement, or balance sheet.

- 1. Accounts Payable
- 2. Accounts Receivable
- 3. Cash
- 4. Dividends
- 5. Fees Earned

- 6. Supplies
- 7. Unearned Rent
- 8. Utilities Expense
- 9. Wages Expense
- 10. Wages Payable

EX 4-2 Classifying accounts

OBJ. 1, 2

Balances for each of the following accounts appear in an adjusted trial balance. Identify each as (a) asset, (b) liability, (c) revenue, or (d) expense.

- 1. Accounts Receivable
- 2. Equipment
- 3. Fees Earned
- 4. Insurance Expense
- 5. Prepaid Advertising
- 6. Prepaid Rent

- 7. Rent Revenue
- 8. Salary Expense
- 9. Salary Payable
- 10. Supplies
- 11. Supplies Expense
- 12. Unearned Rent



EX 4-3 Financial statements from the end-of-period spreadsheet

OBJ. 1, 2

Bamboo Consulting is a consulting firm owned and operated by Lisa Gooch. The following end-of-period spreadsheet was prepared for the year ended July 31, 2016:

	А	В	С	D	Е	F	G	
1		Bamboo Consulting						
2			End	-of-Perioc	l Spreadsh	neet		
3				Year End	led July 31	, 2016		
4		Unadj	usted			Adju	sted	
5		Trial Ba	alance	Adjus	tments	Trial B	alance	
6	Account Title	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	
7								
8	Cash	58,000				58,000		
9	Accounts Receivable	106,200				106,200		
10	Supplies	11,900			(a) 7,500	4,400		
11	Office Equipment	515,000				515,000		
12	Accumulated Depreciation		28,000		(b) 5,600		33,600	
13	Accounts Payable		20,500				20,500	
14	Salaries Payable				(c) 2,500		2,500	
15	Common Stock		150,000				150,000	
16	Retained Earnings		366,700				366,700	
17	Dividends	25,000				25,000		
18	Fees Earned		348,500				348,500	
19	Salary Expense	186,500		(c) 2,500		189,000		
20	Supplies Expense			(a) 7,500		7,500		
21	Depreciation Expense			(b) 5,600		5,600		
22	Miscellaneous Expense	_11,100				_11,100		
23		913,700	913,700	<u>15,600</u>	<u>15,600</u>	921,800	921,800	

Based on the preceding spreadsheet, prepare an income statement, retained earnings statement, and balance sheet for Bamboo Consulting.

ME HOW

EX 4-4 Financial statements from the end-of-period spreadsheet

OBJ. 1, 2

Elliptical Consulting is a consulting firm owned and operated by Jayson Neese. The following end-of-period spreadsheet was prepared for the year ended June 30, 2016:

	А	В	С	D	Е	F	G		
1			Elliptical Consulting						
2			End	-of-Perio	d Spreadsl	neet			
3			For the	Year En	ded June 3	0, 2016			
4		Unadj				Adju			
5		Trial B	alance	Adju	stments	Trial Ba	alance		
6	Account Title	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.		
7									
8	Cash	27,000				27,000			
9	Accounts Receivable	53,500				53,500			
10	Supplies	3,000			(a) 2,100	900			
11	Office Equipment	30,500				30,500			
12	Accumulated Depreciation		4,500		(b) 1,500		6,000		
13	Accounts Payable		3,300				3,300		
14	Salaries Payable				(c) 375		375		
15	Common Stock		30,000				30,000		
16	Retained Earnings		52,200				52,200		
17	Dividends	2,000				2,000			
18	Fees Earned		60,000				60,000		
19	Salary Expense	32,000		(c) 37	5	32,375			
20	Supplies Expense			(a) 2,10	0	2,100			
21	Depreciation Expense			(b) 1,50	0	1,500			
22	Miscellaneous Expense	2,000				2,000			
23		<u>150,000</u>	150,000	<u>3,97</u>	<u>3,975</u>	<u>151,875</u>	<u>151,875</u>		

Based on the preceding spreadsheet, prepare an income statement, retained earnings statement, and balance sheet for Elliptical Consulting.

✓ Net income, \$218,000



✓ Net loss, \$20,900



Internet Project



✓ a. Net income: \$2,032

Retained earnings, Dec. 31, 2016: \$1,640,000

✓ Retained earnings,

April 30, 2016:

\$439,300



EX 4-5 Income statement

OBJ. 2

The following account balances were taken from the adjusted trial balance for Laser Messenger Service, a delivery service firm, for the fiscal year ended April 30, 2016:

Depreciation Expense	\$ 8,650	Rent Expense	\$ 60,000
Fees Earned	674,000	Salaries Expense	336,900
Insurance Expense	1,500	Supplies Expense	4,100
Miscellaneous Expense	3,650	Utilities Expense	41,200

Prepare an income statement.

EX 4-6 Income statement; net loss

OBJ. 2

The following revenue and expense account balances were taken from the ledger of Wholistic Health Services Co. after the accounts had been adjusted on February 29, 2016, the end of the fiscal year:

Depreciation Expense	\$ 7,500	Service Revenue	\$448,400
Insurance Expense	3,000	Supplies Expense	2,750
Miscellaneous Expense	8,150	Utilities Expense	33,900
Rent Expense	54,000	Wages Expense	360,000

Prepare an income statement.

EX 4-7 Income statement

OBJ. 2

FedEx Corporation had the following revenue and expense account balances (in millions) for a recent year ending May 31:

Depreciation Expense	\$2,113	Purchased Transportation	\$ 6,335
Fuel Expense	4,956	Rentals and Landing Fees	2,487
Maintenance and Repairs Expense	1,980	Revenues	42,680
Other Expense (Income) Net	5,569	Salaries and Employee Benefits	16,099
Provision for Income Taxes	1,109		

- a. Prepare an income statement.
- Compare your income statement with the income statement that is available at the FedEx Corporation Web site, (http://investors.fedex.com). Click on Annual Report and Download Annual Report. What similarities and differences do you see?

EX 4-8 Retained earnings statement

OBJ. 2

Apex Systems Co. offers its services to residents in the Seattle area. Selected accounts from the ledger of Apex Systems Co. for the fiscal year ended December 31, 2016, are as follows:

	Retained	Earnings			Divid	lends	
Dec. 31	90,000	Jan. 1 (2016)	1,375,000	Mar. 31	22,500	Dec. 31	90,000
		Dec. 31	355,000	June 30	22,500		
				Sept. 30	22,500		
				Dec. 31	22,500		
			Income S	iummary			
		Dec 31	1 415 000	Dec 31	1 770 000		

355,000 31

Prepare a retained earnings statement for the year.

EX 4-9 Retained earnings statement; net loss

OBJ. 2

Selected accounts from the ledger of Restoration Arts for the fiscal year ended April 30, 2016, are as follows:

Retained Earnings				Divid	lends	
Apr. 30	31,200	May 1 (2015) 475,500	Sept. 30	1,250	Apr. 30	5,000
30	5,000		Dec. 31	1,250		
			March 31	1,250		
			June 30	1,250		

Income Summary					
Apr. 30	197,000	Apr. 30	165,800		
		30	31,200		

Prepare a retained earnings statement for the year.

EX 4-10 Classifying assets

OBJ. 2

Identify each of the following as (a) a current asset or (b) property, plant, and equipment:

1. Accounts Receivable

4. Equipment

2. Building

5. Prepaid Insurance

3. Cash

6. Supplies

EX 4-11 Balance sheet classification

OBJ. 2

At the balance sheet date, a business owes a mortgage note payable of \$375,000, the terms of which provide for monthly payments of \$1,250.

Explain how the liability should be classified on the balance sheet.

EX 4-12 Balance sheet

OBJ. 2

Optimum Weight Loss Co. offers personal weight reduction consulting services to individuals. After all the accounts have been closed on November 30, 2016, the end of the fiscal year, the balances of selected accounts from the ledger of Optimum Weight Loss Co. are as follows:

Accounts Payable	\$ 37,700	Prepaid Insurance	\$ 7,200
Accounts Receivable	116,750	Prepaid Rent	21,000
Accumulated Depreciation—Equipment	186,400	Retained Earnings	635,300
Cash	?	Salaries Payable	9,000
Common Stock	75,000	Supplies	4,800
Equipment	474,150	Unearned Fees	18,000
Land	300,000		

Prepare a classified balance sheet that includes the correct balance for Cash.

EX 4-13 Balance sheet

OBJ. 2

List the errors you find in the following balance sheet. Prepare a corrected balance sheet.

Labyrinth Services Co. Balance Sheet For the Year Ended August 31, 2016

Asset	:s		Liabiliti	es	
Current assets:			Current liabilities:		
Cash	\$ 18,500		Accounts receivable	\$ 41,400	
Accounts payable	31,300		Accum. depr.—building	155,000	
Supplies	6,500		Accum. depr.—equipment	25,000	
Prepaid insurance	16,600		Net income	118,200	
Land	225,000		Total liabilities		\$339,600
Total current assets		\$297,900			
Property, plant, and equipment:			Stockholders'	Equity	
Building	\$400,000		Wages payable	\$ 6,500	
Equipment	97,000		Common stock	\$ 75,000	
Total property, plant,			Retained earnings	512,200	
and equipment		635,400	Total stockholders' equity		593,700
			Total liabilities and		
Total assets		\$933,300	stockholders' equity		\$933,300

EX 4-14 Identifying accounts to be closed

OBJ. 3

From the list that follows, identify the accounts that should be closed to Income Summary at the end of the fiscal year:

(Continued)

✓ Total assets:
\$775,000



✓ Corrected balance sheet, total assets: \$625,000

a. Accounts Payable
b. Accumulated Depreciation—Equipment
c. Depreciation Expense—Equipment
d. Equipment
e. Common Stock
g. Fees Earned
h. Land
i. Supplies
j. Supplies Expense
k. Wages Expense

EX 4-15 Closing entries

f. Dividends

OBJ. 3

Prior to its closing, Income Summary had total debits of \$1,190,500 and total credits of \$1,476,300.

1. Wages Payable

Briefly explain the purpose served by the income summary account and the nature of the entries that resulted in the \$1,190,500 and the \$1,476,300.

EX 4-16 Closing entries with net income

OBJ. 3

After all revenue and expense accounts have been closed at the end of the fiscal year, Income Summary has a debit of \$798,400 and a credit of \$955,300. At the same date, Retained Earnings has a credit balance of \$1,439,000, and Dividends has a balance of \$36,000. (a) Journalize the entries required to complete the closing of the accounts. (b) Determine the amount of Retained Earnings at the end of the period.

EX 4-17 Closing entries with net loss

OBJ. 3

Mira Services Co. offers its services to individuals desiring to improve their personal images. After the accounts have been adjusted at October 31, the end of the fiscal year, the following balances were taken from the ledger of Mira Services Co.:

Retained Earnings	\$910,000	Rent Expense	\$72,000
Dividends	16,000	Supplies Expense	11,900
Fees Earned	519,300	Miscellaneous Expense	14,250
Wages Expense	488.000		

Journalize the four entries required to close the accounts.

EX 4-18 Identifying permanent accounts

OBJ. 3

Which of the following accounts will usually appear in the post-closing trial balance?

a. Accounts Payable
b. Accumulated Depreciation
c. Cash
d. Common Stock
e. Dividends
g. Fees Earned
h. Office Equipment
i. Salaries Expense
j. Salaries Payable
k. Supplies

f. Depreciation Expense

EX 4-19 Post-closing trial balance

OBJ. 3

An accountant prepared the following post-closing trial balance:

La Casa Services Co. Post-Closing Trial Balance March 31, 2016

	Debit Balances	Credit Balances
Cash	46,540	
Accounts Receivable	122,260	
Supplies		4,000
Equipment		127,200
Accumulated Depreciation—Equipment	33,600	
Accounts Payable	52,100	
Salaries Payable		6,400
Unearned Rent	9,000	
Common Stock	40,000	
Retained Earnings	158,900	
	462,400	137,600

✓ Correct column totals, \$300,000



MF HOW

Prepare a corrected post-closing trial balance. Assume that all accounts have normal balances and that the amounts shown are correct.

EX 4-20 Steps in the accounting cycle

OBJ. 4

Rearrange the following steps in the accounting cycle in proper sequence:

- a. A post-closing trial balance is prepared.
- b. Adjustment data are asssembled and analyzed.
- c. Adjusting entries are journalized and posted to the ledger.
- d. An adjusted trial balance is prepared.
- e. An optional end-of-period spreadsheet is prepared.
- f. An unadjusted trial balance is prepared.
- g. Closing entries are journalized and posted to the ledger.
- h. Financial statements are prepared.
- i. Transactions are analyzed and recorded in the journal.
- j. Transactions are posted to the ledger.

EX 4-21 Working capital and current ratio

OBJ. 7





The following data (in thousands) were taken from recent financial statements of Under Armour, Inc.:



	Decen	iber 5 i
	Year 2	Year 1
Current assets	\$689,663	\$558,850
Current liabilities	183,607	149,147

- a. Compute the working capital and the current ratio as of December 31, Year 2 and Year 1. Round to two decimal places.
- b. What conclusions concerning the company's ability to meet its financial obligations can you draw from part (a)?

EX 4-22 Working capital and current ratio

OBJ. 7





The following data (in thousands) were taken from recent financial statements of Starbucks Corporation:

	Year 2	Year 1
Current assets	\$4,199,600	\$3,794,900
Current liabilities	2,209,200	2,075,800

- a. Compute the working capital and the current ratio for Year 2 and Year 1. Round to two decimal places.
- b. What conclusions concerning the company's ability to meet its financial obligations can you draw from part (a)?

Appendix

EX 4-23 Completing an end-of-period spreadsheet

List (a) through (j) in the order they would be performed in preparing and completing an end-of-period spreadsheet.

- a. Add the Debit and Credit columns of the Unadjusted Trial Balance columns of the spreadsheet to verify that the totals are equal.
- b. Add the Debit and Credit columns of the Balance Sheet and Income Statement columns of the spreadsheet to verify that the totals are equal.

(Continued)



- c. Add or deduct adjusting entry data to trial balance amounts, and extend amounts to the Adjusted Trial Balance columns.
- d. Add the Debit and Credit columns of the Adjustments columns of the spreadsheet to verify that the totals are equal.
- e. Add the Debit and Credit columns of the Balance Sheet and Income Statement columns of the spreadsheet to determine the amount of net income or net loss for the period.
- f. Add the Debit and Credit columns of the Adjusted Trial Balance columns of the spreadsheet to verify that the totals are equal.
- g. Enter the adjusting entries into the spreadsheet, based on the adjustment data.
- h. Enter the amount of net income or net loss for the period in the proper Income Statement column and Balance Sheet column.
- i. Enter the unadjusted account balances from the general ledger into the Unadjusted Trial Balance columns of the spreadsheet.
- j. Extend the adjusted trial balance amounts to the Income Statement columns and the Balance Sheet columns.

Appendix

EX 4-24 Adjustment data on an end-of-period spreadsheet

✓ Total debits of Adjustments column: \$31

Alert Security Services Co. offers security services to business clients. The trial balance for Alert Security Services Co. has been prepared on the following end-of-period spreadsheet for the year ended October 31, 2016:

Alert Security Services Co. End-of-Period Spreadsheet For the Year Ended October 31, 2016

		ljusted Balance	Adjustments			isted alance
Account Title	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
Cash	12					
Accounts Receivable	90					
Supplies	8					
Prepaid Insurance	12					
Land	190					
Equipment	50					
Accum. Depr.—Equipment		4				
Accounts Payable		36				
Wages Payable		0				
Common Stock		50				
Retained Earnings		210				
Dividends	8					
Fees Earned		200				
Wages Expense	110					
Rent Expense	12					
Insurance Expense	0					
Utilities Expense	6					
Supplies Expense	0					
Depreciation Expense	0					
Miscellaneous Expense	2					
	500	500				

The data for year-end adjustments are as follows:

- a. Fees earned, but not yet billed, \$13.
- b. Supplies on hand, \$4.
- c. Insurance premiums expired, \$10.

- d. Depreciation expense, \$3.
- e. Wages accrued, but not paid, \$1.

Enter the adjustment data, and place the balances in the Adjusted Trial Balance columns.

Appendix

EX 4-25 Completing an end-of-period spreadsheet

✓ Net income: \$65 Alert Security Services Co. offers security services to business clients. Complete the following end-of-period spreadsheet for Alert Security Services Co.:

Alert Security Services Co. End-of-Period Spreadsheet For the Year Ended October 31, 2016

		usted Balance	Income Statement			nce eet
Account Title	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
Cash	12					
Accounts Receivable	103					
Supplies	4					
Prepaid Insurance	2					
Land	190					
Equipment	50					
Accum. Depr.—Equipment		7				
Accounts Payable		36				
Wages Payable		1				
Common Stock		50				
Retained Earnings		210				
Dividends	8					
Fees Earned		213				
Wages Expense	111					
Rent Expense	12					
Insurance Expense	10					
Utilities Expense	6					
Supplies Expense	4					
Depreciation Expense	3					
Miscellaneous Expense	2					
	517	517				
Net income (loss)						

Appendix

EX 4-26 Financial statements from an end-of-period spreadsheet

✓ Retained earnings, October 31, 2016: \$267 Based on the data in Exercise 4-25, prepare an income statement, retained earnings statement, and balance sheet for Alert Security Services Co.

Appendix

EX 4-27 Adjusting entries from an end-of-period spreadsheet

Based on the data in Exercise 4-24, prepare the adjusting entries for Alert Security Services Co.

Appendix

EX 4-28 Closing entries from an end-of-period spreadsheet

Based on the data in Exercise 4-25, prepare the closing entries for Alert Security Services Co.

Problems: Series A

PR 4-1A Financial statements and closing entries

OBJ. 1, 2, 3

✓ 3. Total assets:
\$354,500



General Ledger



Lamp Light Company maintains and repairs warning lights, such as those found on radio towers and lighthouses. Lamp Light Company prepared the following end-of-period spreadsheet at December 31, 2016, the end of the fiscal year:

	А	В	С	D	Е	F	G	
1			Lamp Light Company					
2				End-of-F	eriod Spre	adsheet		
3			For	the Year E	nded Dece	mber 31, 2	016	
4		Unadj	usted	Adjusted				
5		Trial B	alance	Adjus	tments	Trial B	alance	
6	Account Title	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	
7								
8	Cash	10,800				10,800		
9	Accounts Receivable	38,900				50,200		
10	Prepaid Insurance	4,200		(a) 11,300	(b) 3,000	1,200		
11	Supplies	2,730			(c) 2,250	480		
12	Land	98,000				98,000		
13	Building	400,000				400,000		
14	Accum. Depr.—Building		205,300		(d)10,100		215,400	
15	Equipment	101,000				101,000		
16	Accum. Depr.—Equipment		85,100		(e) 6,680		91,780	
17	Accounts Payable		15,700				15,700	
18	Salaries & Wages Payable				(f) 4,900		4,900	
19	Unearned Rent		2,100	(g) 1,300			800	
20	Common Stock		75,000				75,000	
21	Retained Earnings		128,100				128,100	
22	Dividends	10,000				10,000		
23	Fees Earned		363,700		(a)11,300		375,000	
24	Rent Revenue				(g) 1,300		1,300	
25	Salaries & Wages Expense	163,100		(f) 4,900		168,000		
26	Advertising Expense	21,700				21,700		
27	Utilities Expense	11,400				11,400		
28	Depr. Exp.—Building			(d) 10,100		10,100		
29	Repairs Expense	8,850				8,850		
30	Depr. Exp.—Equipment			(e) 6,680		6,680		
	Insurance Expense			(b) 3,000		3,000		
	Supplies Expense			(c) 2,250		2,250		
33	Misc. Expense	4,320				4,320		
34		<u>875,000</u>	<u>875,000</u>	<u>39,530</u>	<u>39,530</u>	<u>907,980</u>	<u>907,980</u>	

Instructions

- 1. Prepare an income statement for the year ended December 31.
- 2. Prepare a retained earnings statement for the year ended December 31.
- 3. Prepare a balance sheet as of December 31.
- 4. Based upon the end-of-period spreadsheet, journalize the closing entries.
- 5. Prepare a post-closing trial balance.

PR 4-2A Financial statements and closing entries

OBJ. 2, 3

Finders Investigative Services is an investigative services firm that is owned and operated by Stacy Tanner. On June 30, 2016, the end of the fiscal year, the accountant for Finders Investigative Services prepared an end-of-period spreadsheet, a part of which follows:

✓ 1. Retained earnings, June 30: \$403,300

	А	F	G			
1	Finders Investigative Services					
2	End-of-Perio	od Spreadshe	et			
3	For the Year Ended June 30, 2016					
4	Adjusted					
5	((Trial Ba	lance			
6	Account Title	Dr.	Cr.			
7	((
8	Cash	28,000				
9	Accounts Receivable	69,600				
10	Supplies	4,600				
11	Prepaid Insurance	2,500				
12	Building	439,500				
13	Accumulated Depreciation—Building)	44,200			
14	Accounts Payable		11,700			
15	Salaries Payable		3,000			
16	Unearned Rent		2,000			
17	Common Stock		80,000			
18	Retained Earnings		293,800			
19	Dividends	12,000				
20	Service Fees	/	718,000			
21	Rent Revenue	\	12,000			
22		522,100				
23	Rent Expense	48,000				
24	Supplies Expense	10,800				
25	Depreciation Expense—Building	8,750				
26	Utilities Expense	7,150				
27		3,000				
28	Insurance Expense	2,500				
29	Miscellaneous Expense	6,200				
30		1,164,700	1,164,700			

Instructions

- 1. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 2. Journalize the entries that were required to close the accounts at June 30.
- 3. If Retained Earnings has instead decreased \$30,000 after the closing entries were posted, and the dividends remained the same, what would have been the amount of net income or net loss?

PR 4-3A T accounts, adjusting entries, financial statements, and closing entries; optional end-of-period spreadsheet

OBJ. 2, 3

The unadjusted trial balance of Epicenter Laundry at June 30, 2016, the end of the fiscal year, follows:

Epicenter Laundry Unadjusted Trial Balance June 30, 2016

	Debit Balances	Credit Balances
Cash	11,000	
Laundry Supplies	21,500	
Prepaid Insurance	9,600	
Laundry Equipment	232,600	
Accumulated Depreciation		125,400
Accounts Payable		11,800
Common Stock		40,000
Retained Earnings		65,600
Dividends	10,000	
_aundry Revenue		232,200
Wages Expense	125,200	
Rent Expense	40,000	
Utilities Expense	19,700	
Miscellaneous Expense	5,400	
	475,000	475,000
		(Continued

✓ 5. Net income:
\$10,700



General Ledger

The data needed to determine year-end adjustments are as follows:

- a. Laundry supplies on hand at June 30 are \$3,600.
- b. Insurance premiums expired during the year are \$5,700.
- c. Depreciation of laundry equipment during the year is \$6,500.
- d. Wages accrued but not paid at June 30 are \$1,100.

Instructions

- For each account listed in the unadjusted trial balance, enter the balance in a T account. Identify the balance as "June 30 Bal." In addition, add T accounts for Wages Payable, Depreciation Expense, Laundry Supplies Expense, Insurance Expense, and Income Summary.
- 2. (Optional) Enter the unadjusted trial balance on an end-of-period spreadsheet and complete the spreadsheet. Add the accounts listed in part (1) as needed.
- 3. Journalize and post the adjusting entries. Identify the adjustments by "Adj." and the new balances as "Adj. Bal."
- 4. Prepare an adjusted trial balance.
- 5. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 6. Journalize and post the closing entries. Identify the closing entries by "Clos."
- 7. Prepare a post-closing trial balance.

PR 4-4A Ledger accounts, adjusting entries, financial statements, and closing entries; optional spreadsheet

OBJ. 2, 3

The unadjusted trial balance of Lakota Freight Co. at March 31, 2016, the end of the year, follows:

Lakota Freight Co. Unadjusted Trial Balance March 31, 2016

		Debit Balances	Credit Balances
11	Cash	12,000	
13	Supplies	30,000	
14	Prepaid Insurance	3,600	
16	Equipment	110,000	
17	Accumulated Depreciation—Equipment		25,000
18	Trucks	60,000	
19	Accumulated Depreciation—Trucks		15,000
21	Accounts Payable		4,000
31	Common Stock		26,000
32	Retained Earnings		70,000
3	Dividends	15,000	
1 1	Service Revenue		160,000
51	Wages Expense	45,000	
53	Rent Expense	10,600	
54	Truck Expense	9,000	
59	Miscellaneous Expense	4,800	
		300,000	300,000

The data needed to determine year-end adjustments are as follows:

- a. Supplies on hand at March 31 are \$7,500.
- b. Insurance premiums expired during year are \$1,800.
- c. Depreciation of equipment during year is \$8,350.
- d. Depreciation of trucks during year is \$6,200.
- e. Wages accrued but not paid at March 31 are \$600.

✓ 5. Net income: \$51,150

General Ledger

Instructions

- For each account listed in the trial balance, enter the balance in the appropriate Balance column of a four-column account and place a check mark (✓) in the Posting Reference column.
- 2. (Optional) Enter the unadjusted trial balance on an end-of-period spreadsheet and complete the spreadsheet. Add the accounts listed in part (3) as needed.
- 3. Journalize and post the adjusting entries, inserting balances in the accounts affected. Record the adjusting entries on Page 26 of the journal. The following additional accounts from Lakota Freight Co.'s chart of accounts should be used: Wages Payable, 22; Supplies Expense, 52; Depreciation Expense—Equipment, 55; Depreciation Expense—Trucks, 56; Insurance Expense, 57.
- 4. Prepare an adjusted trial balance.
- 5. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 6. Journalize and post the closing entries. Record the closing entries on Page 27 of the journal. (Income Summary is account #34 in the chart of accounts.) Indicate closed accounts by inserting a line in both Balance columns opposite the closing entry.
- 7. Prepare a post-closing trial balance.

PR 4-5A Complete accounting cycle

OBJ. 4, 5

For the past several years, Steffy Lopez has operated a part-time consulting business from his home. As of July 1, 2016, Steffy decided to move to rented quarters and to operate the business, which was to be known as Diamond Consulting, on a full-time basis. Diamond Consulting entered into the following transactions during July:

- July 1. The following assets were received from Steffy Lopez in exchange for common stock: cash, \$13,500; accounts receivable, \$20,800; supplies, \$3,200; and office equipment, \$7,500. There were no liabilities received.
 - 1. Paid two months' rent on a lease rental contract, \$4,800.
 - 2. Paid the premiums on property and casualty insurance policies, \$4,500.
 - 4. Received cash from clients as an advance payment for services to be provided, and recorded it as unearned fees, \$5,500.
 - 5. Purchased additional office equipment on account from Office Station Co., \$6,500.
 - 6. Received cash from clients on account, \$15,300.
 - 10. Paid cash for a newspaper advertisement, \$400.
 - 12. Paid Office Station Co. for part of the debt incurred on July 5, \$5,200.
 - 12. Recorded services provided on account for the period July 1-12, \$13,300.
 - 14. Paid receptionist for two weeks' salary, \$1,750.

Record the following transactions on Page 2 of the journal:

- 17. Recorded cash from cash clients for fees earned during the period July 1–17, \$9,450.
- 18. Paid cash for supplies, \$600.
- 20. Recorded services provided on account for the period July 13-20, \$6,650.
- 24. Recorded cash from cash clients for fees earned for the period July 17–24, \$4,000.
- 26. Received cash from clients on account, \$12,000.
- 27. Paid receptionist for two weeks' salary, \$1,750.
- 29. Paid telephone bill for July, \$325.
- 31. Paid electricity bill for July, \$675.
- 31. Recorded cash from cash clients for fees earned for the period July 25-31, \$5,200.
- 31. Recorded services provided on account for the remainder of July, \$3,000.
- 31. Paid dividends, \$12,500.

(Continued)

✓ 8. Net income:
\$33,475

Instructions

1. Journalize each transaction in a two-column journal starting on Page 1, referring to the following chart of accounts in selecting the accounts to be debited and credited. (Do not insert the account numbers in the journal at this time.)

11 Cash 31 Common Stock 12 Accounts Receivable 32 **Retained Earnings** 14 Supplies 33 Dividends 15 Prepaid Rent 41 Fees Earned 16 Prepaid Insurance 51 Salary Expense 18 Office Equipment 52 Rent Expense 19 Accumulated Depreciation 53 Supplies Expense 21 Accounts Payable 54 Depreciation Expense 22 Salaries Payable 55 Insurance Expense 23 Unearned Fees 59 Miscellaneous Expense

- 2. Post the journal to a ledger of four-column accounts.
- 3. Prepare an unadjusted trial balance.
- 4. At the end of July, the following adjustment data were assembled. Analyze and use these data to complete parts (5) and (6).
 - a. Insurance expired during July is \$375.
 - b. Supplies on hand on July 31 are \$1,525.
 - c. Depreciation of office equipment for July is \$750.
 - d. Accrued receptionist salary on July 31 is \$175.
 - e. Rent expired during July is \$2,400.
 - f. Unearned fees on July 31 are \$2,750.
- 5. *(Optional)* Enter the unadjusted trial balance on an end-of-period spreadsheet and complete the spreadsheet.
- 6. Journalize and post the adjusting entries. Record the adjusting entries on Page 3 of the journal.
- 7. Prepare an adjusted trial balance.
- 8. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 9. Prepare and post the closing entries. (Income Summary is account #34 in the chart of accounts.) Record the closing entries on Page 4 of the journal. Indicate closed accounts by inserting a line in both the Balance columns opposite the closing entry.
- 10. Prepare a post-closing trial balance.

Problems: Series B

PR 4-1B Financial statements and closing entries

OBJ. 1, 2, 3

Last Chance Company offers legal consulting advice to prison inmates. Last Chance Company prepared the end-of-period spreadsheet that follows at June 30, 2016, the end of the fiscal year.

Instructions

- 1. Prepare an income statement for the year ended June 30.
- 2. Prepare a retained earnings statement for the year ended June 30.
- 3. Prepare a balance sheet as of June 30.
- 4. On the basis of the end-of-period spreadsheet, journalize the closing entries.
- 5. Prepare a post-closing trial balance.

✓ 3. Total assets: \$342,425



General Ledger



	А	В	С	D	Е	F	G		
1			Last Chance Company						
2			End	-of-Period	l Spreadsh	neet			
3			For the	Year End	ed June 3	0, 2016			
4		Unadj	Unadjusted Adju						
5		Trial Ba	alance	Adjust	tments	Trial Ba	alance		
6	Account Title	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.		
7									
8	Cash	5,100				5,100			
9	Accounts Receivable	22,750		(a) 3,750		26,500			
10	Prepaid Insurance	3,600			(b) 1,300	2,300			
11	Supplies	2,025			(c) 1,500	525			
12	Land	80,000				80,000			
13	Building	340,000				340,000			
14	Accum. Depr.—Building		190,000		(d) 3,000		193,000		
15	Equipment	140,000				140,000			
16	Accum. Depr.—Equipment		54,450		(e) 4,550		59,000		
			9,750				9,750		
18	Salaries & Wages Payable				(f) 1,900		1,900		
19	Unearned Rent		4,500	(g) 3,000			1,500		
20	Common Stock		90,000				90,000		
21	Retained Earnings		271,300				271,300		
22	Dividends	20,000				20,000			
23	Fees Earned		280,000		(a) 3,750		283,750		
24	Rent Revenue				(g) 3,000		3,000		
25	Salaries & Wages Expense	145,100		(f) 1,900		147,000			
26	Advertising Expense	86,800				86,800			
27	Utilities Expense	30,000				30,000			
28	Travel Expense	18,750				18,750			
29	Depr. Exp.—Equipment			(e) 4,550		4,550			
30	Depr. Exp.—Building			(d) 3,000		3,000			
31	Supplies Expense			(c) 1,500		1,500			
32	Insurance Expense			(b) 1,300		1,300			
33	Misc. Expense	5,875				5,875			
34		900,000	900,000	19,000	19,000	913,200	913,200		

PR 4-2B Financial statements and closing entries

OBJ. 2, 3

✓ 1. Retained earnings, October 31: \$288,000

The Gorman Group is a financial planning services firm owned and operated by Nicole Gorman. As of October 31, 2016, the end of the fiscal year, the accountant for The Gorman Group prepared an end-of-period spreadsheet, part of which follows:

	А	F	G
1	The Gorman Group		
2	End-of-Period Spread	sheet	
3	For the Year Ended Octobe		
4		usted	
5	((Trial I	Balance
6	Account Title	Dr.	Cr.
7	((
8	Cash	11,000	
9	Accounts Receivable	28,150	
10	Supplies	6,350	
11	Prepaid Insurance	9,500	
12	Land	75,000	
13	Buildings	250,000	
14	Accumulated Depreciation—Buildings)	117,200
15	Equipment	240,000	
16	Accumulated Depreciation—Equipment)	151,700
17	Accounts Payable		33,300
18	Salaries Payable)	3,300
19	Unearned Rent		1,500
20	Common Stock)	25,000
21	Retained Earnings	/	195,000
22	Dividends	20,000	
23	Service Fees	/	468,000
	Rent Revenue)	5,000
25	Salaries Expense	291,000	
26	Depreciation Expense—Equipment	17,500	
27	Rent Expense	15,500	
28	Supplies Expense	9,000	
29	Utilities Expense	8,500	
30	Depreciation Expense—Buildings	6,600	
31	Repairs Expense	3,450	
32	Insurance Expense	3,000	
33	Miscellaneous Expense	5,450	
34)	<u>1,000,000</u>	1,000,000

(Continued)

Instructions

- 1. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 2. Journalize the entries that were required to close the accounts at October 31.
- 3. If the balance of Retained Earnings had instead increased \$115,000 after the closing entries were posted, and the dividends remained the same, what would have been the amount of net income or net loss?

PR 4-3B T accounts, adjusting entries, financial statements, and closing entries; optional end-of-period spreadsheet

OBJ. 2, 3

✓ 5. Net income: \$27,350 The unadjusted trial balance of La Mesa Laundry at August 31, 2016, the end of the fiscal year, follows:





La Mesa Laundry Unadjusted Trial Balance August 31, 2016

g,		
	Debit Balances	Credit Balances
Cash	3,800	
Laundry Supplies	9,000	
Prepaid Insurance	6,000	
Laundry Equipment	180,800	
Accumulated Depreciation		49,200
Accounts Payable		7,800
Common Stock		15,000
Retained Earnings		80,000
Dividends	2,400	
Laundry Revenue		248,000
Wages Expense	135,800	
Rent Expense	43,200	
Utilities Expense	16,000	
Miscellaneous Expense	3,000	
	400,000	400,000

The data needed to determine year-end adjustments are as follows:

- a. Wages accrued but not paid at August 31 are \$2,200.
- b. Depreciation of equipment during the year is \$8,150.
- c. Laundry supplies on hand at August 31 are \$2,000.
- d. Insurance premiums expired during the year are \$5,300.

Instructions

- For each account listed in the unadjusted trial balance, enter the balance in a T account. Identify the balance as "Aug. 31 Bal." In addition, add T accounts for Wages Payable, Depreciation Expense, Laundry Supplies Expense, Insurance Expense, and Income Summary.
- 2. (Optional) Enter the unadjusted trial balance on an end-of-period spreadsheet and complete the spreadsheet. Add the accounts listed in part (1) as needed.
- 3. Journalize and post the adjusting entries. Identify the adjustments by "Adj." and the new balances as "Adj. Bal."
- 4. Prepare an adjusted trial balance.
- 5. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 6. Journalize and post the closing entries. Identify the closing entries by "Clos."
- 7. Prepare a post-closing trial balance.

PR 4-4B Ledger accounts, adjusting entries, financial statements, and closing entries; optional end-of-period spreadsheet

OBJ. 2, 3

✓ 5. Net income:
\$46,150

General Ledger

Recessive Interiors Unadjusted Trial Balance January 31, 2016

The unadjusted trial balance of Recessive Interiors at January 31, 2016, the end of the

	, , , , , , , , , , , , , , , , , , , ,	Debit	Credit
		Balances	Balances
11	Cash	13,100	
13	Supplies	8,000	
14	Prepaid Insurance	7,500	
16	Equipment	113,000	
17	Accumulated Depreciation—Equipment		12,000
18	Trucks	90,000	
19	Accumulated Depreciation—Trucks		27,100
21	Accounts Payable		4,500
31	Common Stock		30,000
32	Retained Earnings		96,400
33	Dividends	3,000	
41	Service Revenue		155,000
51	Wages Expense	72,000	
52	Rent Expense	7,600	
53	Truck Expense	5,350	
59	Miscellaneous Expense	5,450	
		325,000	325,000

The data needed to determine year-end adjustments are as follows:

- a. Supplies on hand at January 31 are \$2,850.
- b. Insurance premiums expired during the year are \$3,150.
- c. Depreciation of equipment during the year is \$5,250.
- d. Depreciation of trucks during the year is \$4,000.
- e. Wages accrued but not paid at January 31 are \$900.

Instructions

year, follows:

- 1. For each account listed in the unadjusted trial balance, enter the balance in the appropriate Balance column of a four-column account and place a check mark (✓) in the Posting Reference column.
- 2. (Optional) Enter the unadjusted trial balance on an end-of-period spreadsheet and complete the spreadsheet. Add the accounts listed in part (3) as needed.
- 3. Journalize and post the adjusting entries, inserting balances in the accounts affected. Record the adjusting entries on Page 26 of the journal. The following additional accounts from Recessive Interiors' chart of accounts should be used: Wages Payable, 22; Depreciation Expense—Equipment, 54; Supplies Expense, 55; Depreciation Expense—Trucks, 56; Insurance Expense, 57.
- 4. Prepare an adjusted trial balance.
- 5. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 6. Journalize and post the closing entries. Record the closing entries on Page 27 of the journal. (Income Summary is account #34 in the chart of accounts.) Indicate closed accounts by inserting a line in both Balance columns opposite the closing entry.
- 7. Prepare a post-closing trial balance.

PR 4-5B Complete accounting cycle

OBJ. 4, 5

For the past several years, Jeff Horton has operated a part-time consulting business from his home. As of April 1, 2016, Jeff decided to move to rented quarters and to operate the

(Continued)

✓ 8. Net income: \$53,775 business, which was to be known as Rosebud Consulting, on a full-time basis. Rosebud Consulting entered into the following transactions during April:

- Apr. 1. The following assets were received from Jeff Horton in exchange for common stock: cash, \$20,000; accounts receivable, \$14,700; supplies, \$3,300; and office equipment, \$12,000. There were no liabilities received.
 - 1. Paid three months' rent on a lease rental contract, \$6,000.
 - 2. Paid the premiums on property and casualty insurance policies, \$4,200.
 - 4. Received cash from clients as an advance payment for services to be provided and recorded it as unearned fees, \$9,400.
 - Purchased additional office equipment on account from Smith Office Supply Co., \$8,000.
 - 6. Received cash from clients on account, \$11,700.
 - 10. Paid cash for a newspaper advertisement, \$350.
 - 12. Paid Smith Office Supply Co. for part of the debt incurred on April 5, \$6,400.
 - 12. Recorded services provided on account for the period April 1-12, \$21,900.
 - 14. Paid receptionist for two weeks' salary, \$1,650.

Record the following transactions on Page 2 of the journal:

- 17. Recorded cash from cash clients for fees earned during the period April 1–16, \$6,600.
- 18. Paid cash for supplies, \$725.
- 20. Recorded services provided on account for the period April 13-20, \$16,800.
- 24. Recorded cash from cash clients for fees earned for the period April 17–24, \$4,450.
- 26. Received cash from clients on account, \$26,500.
- 27. Paid receptionist for two weeks' salary, \$1,650.
- 29. Paid telephone bill for April, \$540.
- 30. Paid electricity bill for April, \$760.
- 30. Recorded cash from cash clients for fees earned for the period April 25–30, \$5,160.
- 30. Recorded services provided on account for the remainder of April, \$2,590.
- 30. Paid dividends, \$18,000.

Instructions

1. Journalize each transaction in a two-column journal starting on Page 1, referring to the following chart of accounts in selecting the accounts to be debited and credited. (Do not insert the account numbers in the journal at this time.)

11 Cash
12 Accounts Receivable
14 Supplies
15 Prepaid Rent
16 Prepaid Insurance
18 Office Equipment
19 Accumulated Depreciation
21 Accounts Payable

22 Salaries Payable

23 Unearned Fees

31 Common Stock
32 Retained Earnings
33 Dividends
41 Fees Earned
51 Salary Expense
52 Supplies Expense

52 Supplies Expense53 Rent Expense54 Depreciation Expense

55 Insurance Expense59 Miscellaneous Expense

- 2. Post the journal to a ledger of four-column accounts.
- 3. Prepare an unadjusted trial balance.
- 4. At the end of April, the following adjustment data were assembled. Analyze and use these data to complete parts (5) and (6).
 - a. Insurance expired during April is \$350.
 - b. Supplies on hand on April 30 are \$1,225.

- c. Depreciation of office equipment for April is \$400.
- d. Accrued receptionist salary on April 30 is \$275.
- e. Rent expired during April is \$2,000.
- f. Unearned fees on April 30 are \$2,350.
- 5. (Optional) Enter the unadjusted trial balance on an end-of-period spreadsheet and complete the spreadsheet.
- 6. Journalize and post the adjusting entries. Record the adjusting entries on Page 3 of the journal.
- 7. Prepare an adjusted trial balance.
- 8. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 9. Prepare and post the closing entries. Record the closing entries on Page 4 of the journal. (Income Summary is account #34 in the chart of accounts.) Indicate closed accounts by inserting a line in both the Balance columns opposite the closing entry.
- 10. Prepare a post-closing trial balance.

Continuing Problem

✓ 2. Net income:
\$4,955

General Ledger

The unadjusted trial balance of PS Music as of July 31, 2016, along with the adjustment data for the two months ended July 31, 2016, are shown in Chapter 3. Based upon the adjustment data, the following adjusted trial balance was prepared:

PS Music Adjusted Trial Balance July 31, 2016

	Debit	Credit
	Balances	Balances
Cash	9,945	
Accounts Receivable	4,150	
Supplies	275	
Prepaid Insurance	2,475	
Office Equipment	7,500	
Accumulated Depreciation—Office Equipment		50
Accounts Payable		8,350
Wages Payable		140
Unearned Revenue		3,600
Common Stock		9,000
Dividends	1,750	
Fees Earned		21,200
Music Expense	3,610	
Wages Expense	2,940	
Office Rent Expense	2,550	
Advertising Expense	1,500	
Equipment Rent Expense	1,375	
Utilities Expense	1,215	
Supplies Expense	925	
Insurance Expense	225	
Depreciation Expense	50	
Miscellaneous Expense	1,855	
	42,340	42,340

Instructions

- 1. (Optional) Using the data from Chapter 3, prepare an end-of-period spreadsheet.
- 2. Prepare an income statement, a retained earnings statement, and a balance sheet.

(Continued)

- 3. Journalize and post the closing entries. The retained earnings account is #33 and the income summary account is #34 in the ledger of PS Music. Indicate closed accounts by inserting a line in both Balance columns opposite the closing entry.
- 4. Prepare a post-closing trial balance.

Comprehensive Problem 1

✓ 8. Net income, \$33,425



General Ledger

Kelly Pitney began her consulting business, Kelly Consulting, on April 1, 2016. The accounting cycle for Kelly Consulting for April, including financial statements, was illustrated in this chapter. During May, Kelly Consulting entered into the following transactions:

- May 3. Received cash from clients as an advance payment for services to be provided and recorded it as unearned fees, \$4,500.
 - 5. Received cash from clients on account, \$2,450.
 - 9. Paid cash for a newspaper advertisement, \$225.
 - 13. Paid Office Station Co. for part of the debt incurred on April 5, \$640.
 - 15. Recorded services provided on account for the period May 1-15, \$9,180.
 - 16. Paid part-time receptionist for two weeks' salary including the amount owed on April 30, \$750.
 - 17. Recorded cash from cash clients for fees earned during the period May 1–16, \$8,360.

Record the following transactions on Page 6 of the journal:

- 20. Purchased supplies on account, \$735.
- 21. Recorded services provided on account for the period May 16-20, \$4,820.
- 25. Recorded cash from cash clients for fees earned for the period May 17-23, \$7,900.
- 27. Received cash from clients on account, \$9,520.
- 28. Paid part-time receptionist for two weeks' salary, \$750.
- 30. Paid telephone bill for May, \$260.
- 31. Paid electricity bill for May, \$810.
- 31. Recorded cash from cash clients for fees earned for the period May 26-31, \$3,300.
- 31. Recorded services provided on account for the remainder of May, \$2,650.
- 31. Paid dividends, \$10,500.

Instructions

- 1. The chart of accounts for Kelly Consulting is shown in Exhibit 9, and the post-closing trial balance as of April 30, 2016, is shown in Exhibit 17. For each account in the post-closing trial balance, enter the balance in the appropriate Balance column of a four-column account. Date the balances May 1, 2016, and place a check mark (✓) in the Posting Reference column. Journalize each of the May transactions in a two-column journal starting on Page 5 of the journal and using Kelly Consulting's chart of accounts. (Do not insert the account numbers in the journal at this time.)
- 2. Post the journal to a ledger of four-column accounts.
- 3. Prepare an unadjusted trial balance.
- 4. At the end of May, the following adjustment data were assembled. Analyze and use these data to complete parts (5) and (6).
 - a. Insurance expired during May is \$275.
 - b. Supplies on hand on May 31 are \$715.
 - c. Depreciation of office equipment for May is \$330.
 - d. Accrued receptionist salary on May 31 is \$325.
 - e. Rent expired during May is \$1,600.
 - f. Unearned fees on May 31 are \$3,210.

- 5. (Optional) Enter the unadjusted trial balance on an end-of-period spreadsheet and complete the spreadsheet.
- 6. Journalize and post the adjusting entries. Record the adjusting entries on Page 7 of the journal.
- 7. Prepare an adjusted trial balance.
- 8. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 9. Prepare and post the closing entries. Record the closing entries on Page 8 of the journal. (Income Summary is account #34 in the chart of accounts.) Indicate closed accounts by inserting a line in both the Balance columns opposite the closing entry.
- 10. Prepare a post-closing trial balance.

Cases & Projects



CP 4-1 Ethics and professional conduct in business

Picasso Graphics is a graphics arts design consulting firm. Pablo Taylor, its treasurer and vice president of finance, has prepared a classified balance sheet as of July 31, 2016, the end of its fiscal year. This balance sheet will be submitted with Picasso Graphics' loan application to Paris Trust & Savings Bank.

In the Current Assets section of the balance sheet, Pablo reported a \$56,000 receivable from Becky Holt, the president of Picasso Graphics, as a trade account receivable. Becky borrowed the money from Picasso Graphics in January 2014 for a down payment on a new home. She has orally assured Pablo that she will pay off the account receivable within the next year. Pablo reported the \$56,000 in the same manner on the preceding year's balance sheet.

Evaluate whether it is acceptable for Pablo to prepare the July 31, 2016, balance sheet in this manner.

CP 4-2 Financial statements

The following is an excerpt from a telephone conversation between Ben Simpson, president of Main Street Co., and Tami Lundgren, owner of Reliable Employment Co.:

Ben: Tami, you're going to have to do a better job of finding me a new computer programmer. That last guy was great at programming, but he didn't have any common sense.

Tami: What do you mean? The guy had a master's degree with straight A's.

Ben: Yes, well, last month he developed a new financial reporting system. He said we could do away with manually preparing an end-of-period spreadsheet and financial statements. The computer would automatically generate our financial statements with "a push of a button."

Tami: So what's the big deal? Sounds to me like it would save you time and effort.

Ben: Right! The balance sheet showed a minus for supplies!

Tami: Minus supplies? How can that be?

Ben: That's what I asked.

Tami: So, what did he say?

Ben: Well, after he checked the program, he said that it must be right. The minuses were greater than the pluses. . . .

Tami: Didn't he know that Supplies can't have a credit balance—it must have a debit balance?

Ben: He asked me what a debit and credit were.

Tami: I see your point.

- 1. Comment on (a) the desirability of computerizing Main Street Co.'s financial reporting system, (b) the elimination of the end-of-period spreadsheet in a computerized accounting system, and (c) the computer programmer's lack of accounting knowledge.
- 2. Explain to the programmer why Supplies could not have a credit balance.

CP 4-3 Financial statements

Assume that you recently accepted a position with Five Star National Bank & Trust as an assistant loan officer. As one of your first duties, you have been assigned the responsibility of evaluating a loan request for \$300,000 from West Gate Auto Co., a small corporation. In support of the loan application, Joan Whalen, owner and sole stockholder, submitted a "Statement of Accounts" (trial balance) for the first year of operations ended October 31, 2016.

West Gate Auto Co. Statement of Accounts October 31, 2016

5,000	
40,000	
7,500	
222,300	
50,000	
	31,000
	179,000
	215,000
75,000	
10,000	
8,000	
6,000	
1,200	
425,000	425,000
	40,000 7,500 222,300 50,000 75,000 10,000 8,000 6,000 1,200

- 1. Explain to Joan Whalen why a set of financial statements (income statement, retained earnings statement, and balance sheet) would be useful to you in evaluating the loan request.
- 2. In discussing the "Statement of Accounts" with Joan Whalen, you discovered that the accounts had not been adjusted at October 31. Analyze the "Statement of Accounts" and indicate possible adjusting entries that might be necessary before an accurate set of financial statements could be prepared.
- 3. Assuming that an accurate set of financial statements will be submitted by Joan Whalen in a few days, what other considerations or information would you require before making a decision on the loan request?

CP 4-4 Compare balance sheets

Group Project

In groups of three or four, compare the balance sheets of two different companies, and present to the class a summary of the similarities and differences of the two companies. You may obtain the balance sheets you need from one of the following sources:

- 1. Your school or local library.
- 2. The investor relations department of each company.
- 3. The company's Web site on the Internet.
- 4. EDGAR (Electronic Data Gathering, Analysis, and Retrieval), the electronic archives of financial statements filed with the Securities and Exchange Commission.

SEC documents can be retrieved using the EdgarScan™ service at http://sec.gov. To obtain annual report information, under Filings & Forms click on "Search for Company Filings," click on "Company or fund name, ticker symbol, …" type in the company name, and then click on "Find Companies." Click on the CIK related to the company name, search for Form 10-K, and click on "Retrieve Selected Findings." Finally, click on the "html" for the latest period and the related document.

Internet Project



Accounting for Merchandising Businesses

Dollar Tree Stores, Inc.

hen you are low on cash but need to pick up party supplies, housewares, or other consumer items, where do you go? Many shoppers are turning to **Dollar Tree Stores, Inc.**, the nation's largest single price point dollar retailer with more than 4,000 stores in 48 states. For the fixed price of \$1 on merchandise in its stores, Dollar Tree has worked hard providing "new treasures" every week for the entire family.

Despite the fact that items cost only \$1, the accounting for a merchandiser, like Dollar Tree, is more complex than for a service company. This is because a service company sells only services and has no inventory. With Dollar Tree's locations and merchandise, the company must design its accounting system to not only

record the receipt of goods for resale, but also to keep track of what merchandise is available for sale as well as where the merchandise is located. In addition, Dollar Tree must record the sales and costs of the goods sold for each of its stores. Finally, Dollar Tree must record such data as delivery costs, merchandise discounts, and merchandise returns.

This chapter focuses on the accounting principles and concepts for a merchandising business. In doing so, the basic differences between merchandiser and service company activities are highlighted. The financial statements of a merchandising business and accounting for merchandise transactions are also described and illustrated.

Learning Objectives							
After stud	lying this chapter, you should be able to:	Example Exercises					
(T) a	Distinguish between the activities and financial statements of service and merchandising businesses. Nature of Merchandising Businesses Operating Cycle Financial Statements	EE 5-1					
	Describe and illustrate the accounting for merchandise transactions. Merchandising Transactions Purchases Transactions Sales Transactions Freight Summary: Recording Merchandise Inventory Transactions Dual Nature of Merchandise Transactions Chart of Accounts for a Merchandising Business Sales Taxes and Trade Discounts	EE 5-2 EE 5-3 EE 5-4 EE 5-5					
	Describe and illustrate the financial statements of a merchandising business. Financial Statements for a Merchandising Business Multiple-Step Income Statement Single-Step Income Statement Retained Earnings Statement Balance Sheet						
	Describe the adjusting and closing process for a merchandising business. The Adjusting and Closing Process Adjusting Entry for Inventory Shrinkage Closing Entries	EE 5-6					
5 (Describe and illustrate the use of the ratio of sales to assets in evaluating a company's operating performance. Financial Analysis and Interpretation: Ratio of Sales to Assets	EE 5-7					
	At a Glar	nce 5 Page 243					



Nature of Merchandising Businesses

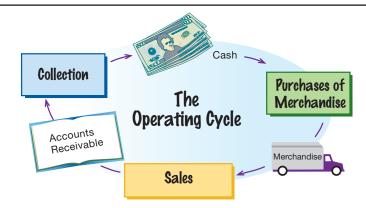
The activities of a service business differ from those of a merchandising business. These differences are reflected in the operating cycles of a service and merchandising business as well as in their financial statements.

Operating Cycle

The **operating cycle** is the process by which a company spends cash, generates revenues, and receives cash either at the time the revenues are generated or later by collecting an accounts receivable. The operating cycle of a service and merchandising business differs in that a merchandising business must purchase merchandise for sale to customers. The operating cycle for a merchandise business is shown in Exhibit 1.

EXHIBIT 1

The Operating Cycle for a Merchandising Business



The time in days to complete an operating cycle differs significantly among merchandise businesses. Grocery stores normally have short operating cycles because of the nature of their merchandise. For example, many grocery items, such as milk, must be sold within their expiration dates of a week or two. In contrast, jewelry stores often carry expensive items that are often displayed months before being sold to customers.

Financial Statements

The differences between service and merchandising businesses are also reflected in their financial statements. For example, these differences are illustrated in the following condensed income statements:

Service Busi	ness	Merchandising Business		
Fees earned	\$XXX	Sales	\$XXX	
Operating expenses	<u>–XXX</u>	Cost of merchandise sold	-XXX	
Net income	\$XXX	Gross profit	\$XXX	
		Operating expenses	-XXX	
		Net income	\$XXX	

The revenue activities of a service business involve providing services to customers. On the income statement for a service business, the revenues from services are reported as fees earned. The operating expenses incurred in providing the services are subtracted from the fees earned to arrive at net income.

In contrast, the revenue activities of a merchandising business involve the buying and selling of merchandise. A merchandising business first purchases merchandise to sell to its customers. When this merchandise is sold, the revenue is reported as sales, and its cost is recognized as an expense. This expense is called the cost of merchandise sold. The cost of merchandise sold is subtracted from sales to arrive at gross profit. This amount is called **gross profit** because it is the profit *before* deducting operating expenses.

Merchandise on hand (not sold) at the end of an accounting period is called merchandise inventory. Merchandise inventory is reported as a current asset on the balance sheet.



Business Connection

H&R BLOCK VERSUS THE HOME DEPOT

H&R Block is a service business that primarily offers tax planning and preparation to its customers. The Home Depot is a large home improvement retailer. The differences in the operations of a service and merchandise business are illustrated in their recent income statements, as shown.

H&R Block Condensed Income Statement (in millions)

Revenue	\$2,794
Operating expenses	2,235
Operating income	\$ 559
Other expense (net)	63
Income before taxes	\$ 496
Income taxes	230
Net income	\$ 266

As discussed in a later chapter, corporations are subject to income taxes. Thus, the income statements of H&R Block and The Home Depot report "income taxes" as a deduction from "income before income taxes" in arriving at net income. This is in contrast to a proprietorship, such as **NetSolutions**, which is not subject to income taxes.

The Home Depot **Condensed Income Statement** (in millions)

Sales	\$70,395
Cost of merchandise sold	46,133
Gross profit	\$24,262
Operating expenses	17,601
Operating income	\$ 6,661
Other expense (net)	593
Income before taxes	\$ 6,068
Income taxes	2,185
Net income	\$ 3,883

Example Exercise 5-1 Gross Profit



During the current year, merchandise is sold for \$250,000 cash and for \$975,000 on account. The cost of the merchandise sold is \$735,000. What is the amount of the gross profit?

.....

Follow My Example 5-1

The gross profit is \$490,000 (\$250,000 + \$975,000 - \$735,000).

Practice Exercises: PE 5-1A, PE 5-1B



Merchandising Transactions

This section illustrates merchandise transactions for **NetSolutions** after it becomes a retailer of computer hardware and software. During 2015, Chris Clark implemented the second phase of NetSolutions' business plan. In doing so, Chris notified clients that beginning July 1, 2016, NetSolutions would no longer offer consulting services. Instead, it would become a retailer.

NetSolutions' business strategy is to offer personalized service to individuals and small businesses that are upgrading or purchasing new computer systems. NetSolutions' personal service includes a no-obligation, on-site assessment of the customer's computer needs. By providing personalized service and follow-up, Chris feels that NetSolutions can compete effectively against such retailers as Best Buy, Office Max, Office Depot, and Dell.

Merchandise transactions are recorded in the accounts, using the rules of debit and credit that are described and illustrated in Chapter 2. However, the accounting system for merchandise businesses is often modified to more efficiently record transactions. For example, an accounting system should be designed to provide information on the amounts due from various customers (accounts receivable) and amounts owed to various creditors (accounts payable). A separate account for each customer and creditor could be added to the ledger. However, as the number of customers and creditors increased, the ledger would become large and awkward to use.

A large number of individual accounts with a common characteristic can be grouped together in a separate ledger, called a **subsidiary ledger**. The primary ledger, which contains all of the balance sheet and income statement accounts, is then called the **general ledger**. Each subsidiary ledger is represented in the general ledger by a summarizing account, called a **controlling account**. The sum of the balances of the accounts in the subsidiary ledger must equal the balance of the related controlling account. Thus, a subsidiary ledger is a secondary ledger that supports a controlling account in the general ledger.

Common subsidiary ledgers are:

- The accounts receivable subsidiary ledger, or customers ledger, lists the individual customer accounts in alphabetical order. The controlling account in the general ledger is Accounts Receivable.
- The accounts payable subsidiary ledger, or creditors ledger, lists individual creditor accounts in alphabetical order. The controlling account in the general ledger is Accounts Payable.
- The **inventory subsidiary ledger**, or *inventory ledger*, lists individual inventory by item (bar code) number. The controlling account in the general ledger is Inventory. An inventory subsidiary ledger is used in a perpetual inventory system.

Most merchandising companies also use computerized accounting systems that record similar transaction in separate journals, which generate purchase, sales, and inventory reports. These separate journals are called **special journals**. However, for simplicity, the journal entries in this chapter will be illustrated using a two-column general journal.¹

¹ Subsidiary ledgers and special journals are further described and illustrated in an online appendix at www.cengagebrain.com.

Purchases Transactions

There are two systems for accounting for merchandise transactions: perpetual and periodic. In a **perpetual inventory system**, each purchase and sale of merchandise is recorded in the inventory account and related subsidiary ledger. In this way, the amount of merchandise available for sale and the amount sold are continuously (perpetually) updated in the inventory records. In a **periodic inventory system**, the inventory does not show the amount of merchandise available for sale and the amount sold. Instead, a listing of inventory on hand, called a **physical inventory**, is prepared at the end of the accounting period. This physical inventory is used to determine the cost of merchandise on hand at the end of the period and the cost of merchandise sold during the period.

Most merchandise companies use computerized perpetual inventory systems. Such systems use bar codes or radio frequency identification codes embedded in a product. An optical scanner or radio frequency identification device is then used to read the product codes and track inventory on hand and sold.

Because computerized perpetual inventory systems are widely used, this chapter illustrates merchandise transactions using a perpetual inventory system. The periodic system is described and illustrated in an appendix at the end of this chapter.

Under the perpetual inventory system, cash purchases of merchandise are recorded as follows:

Journal						
Date		Description	Post. Ref.	Debit	Credit	
Jan.	3	Merchandise Inventory Cash Purchased inventory from Bowen Co.		2,510	2,510	

Purchases of merchandise on account are recorded as follows:

	Jan.	4	Merchandise Inventory Accounts Payable—Thomas Corporation Purchased inventory on account.		9,250	9,250	
--	------	---	---	--	-------	-------	--

The terms of purchases on account are normally indicated on the **invoice** or bill that the seller sends the buyer. An example of an invoice sent to NetSolutions by Alpha Technologies is shown in Exhibit 2.

The terms for when payments for merchandise are to be made are called the **credit terms**. If payment is required on delivery, the terms are cash or net cash. Otherwise, the buyer is allowed an amount of time, known as the **credit period**, in which to pay. The credit period usually begins with the date of the sale as shown on the invoice.

If payment is due within a stated number of days after the invoice date, such as 30 days, the terms are net 30 days. These terms may be written as n/30. If payment is due by the end of the month in which the sale was made, the terms are written as n/eom.

Purchases Discounts To encourage the buyer to pay before the end of the credit period, the seller may offer a discount. For example, a seller may offer a 2% discount if the buyer pays within 10 days of the invoice date. If the buyer does not take the discount, the total invoice amount is due within 30 days. These terms are expressed as 2/10, n/30 and are read as "2% discount if paid within 10 days, net amount due within 30 days." The credit terms of 2/10, n/30 are summarized in Exhibit 3, using the invoice in Exhibit 2.



Corporation, and Walmart, and grocery store chains, such as Winn-Dixie Stores, Inc., and Kroger, use bar codes and optical scanners as part of their computerized inventory systems.

²The word *net* as used here does not have the usual meaning of a number after deductions have been subtracted, as in *net income*.

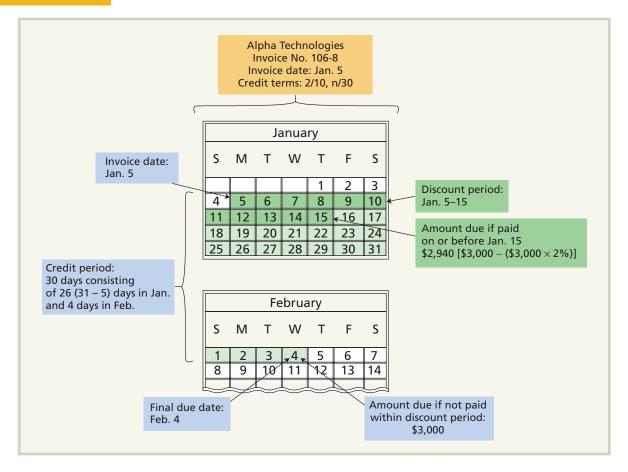
EXHIBIT 2

Invoice

	Alpha Technologies 1000 Matrix Blvd. San Jose, CA 95116-1000		Invoice 106-8 Made in U.S.A.
SOLD TO	CUSTOMER	ORDER	
NetSolutions	ORDER NO.	DATE	
5101 Washington Ave.	. 412	Jan. 3, 2017	
Cincinnati, OH 45227-	-5101		
DATE SHIPPED	HOW SHIPPED AND ROUTE	TERMS	INVOICE DATE
Jan. 5, 2017	US Express Trucking Co.	2/10, n/30	Jan. 5, 2017
FROM	F.O.B.		
San Jose	Cincinnati		
QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
		150.00	3,000.00

EXHIBIT 3

Credit Terms



Discounts taken by the buyer for early payment of an invoice are called **purchases discounts**. Purchases discounts taken by a buyer reduce the cost of the merchandise purchased. Even if the buyer has to borrow to pay within a discount period, it is normally to the buyer's advantage to do so. For this reason, accounting systems are normally designed so that all available discounts are taken.

To illustrate, the invoice shown in Exhibit 2 is used. The last day of the discount period is January 15 (invoice date of January 5 plus 10 days). Assume that in order to pay the invoice on January 15, **NetSolutions** borrows \$2,940, which is \$3,000 less the discount of \$60 (\$3,000 \times 2%). If an annual interest rate of 6% and a 360-day year is also assumed, the interest on the loan of \$2,940 for the remaining 20 days of the credit period is \$9.80 (\$2,940 \times 6% \times 20 \div 360).

The net savings to NetSolutions of taking the discount is \$50.20, computed as follows:

Discount of 2% on \$3,000	\$60.00
Interest for 20 days at a rate of 6% on \$2,940	9.80
Savings from taking the discount	\$50.20

The savings can also be seen by comparing the interest rate on the money *saved* by taking the discount and the interest rate on the money *borrowed* to take the discount. The interest rate on the money saved in the prior example is estimated by converting 2% for 20 days to a yearly rate, as follows:

$$2\% \times \frac{360 \text{ days}}{20 \text{ days}} = 2\% \times 18 = 36\%$$

NetSolutions borrowed \$2,940 at 6% to take the discount. If NetSolutions does not take the discount, it *pays* an estimated interest rate of 36% for using the \$2,940 for the remaining 20 days of the credit period. Thus, buyers should normally take all available purchase discounts.

Since buyers normally take all purchases discounts, Merchandise Inventory is debited for the net purchase price under the perpetual inventory system. That is, the buyer debits Merchandise Inventory for the amount of the invoice less the discount.⁴

To illustrate, NetSolutions would record the Alpha Technologies invoice and its payment as follows:

Jan.	5	Merchandise Inventory Accounts Payable—Alpha Technologies	2,940	2,940	
	15	Accounts Payable—Alpha Technologies Cash	2,940	2,940	

Purchases Returns and Allowances A buyer may request an allowance for merchandise that is returned (purchases return) or a price allowance (purchases allowance) for damaged or defective merchandise. From a buyer's perspective, such returns and allowances are called **purchases returns and allowances**. In both cases, the buyer normally sends the seller a debit memorandum to notify the seller of reasons for the return (purchase return) or to request a price reduction (purchase allowance).

A **debit memorandum**, often called a **debit memo**, is shown in Exhibit 4. A debit memo informs the seller of the amount the buyer proposes to *debit* to the account payable due the seller. It also states the reasons for the return or the request for the price allowance.

³ To simplify computations and rounding, we use a 360-day year rather than a 365-year.

⁴ To simplify, we assume that all purchase discounts are taken.

Debit Memo

	NetSolutions 5101 Washington Ave. Cincinnati, OH 45227-5101		No. 18
DEBIT MEMO			
то		DATE	
Maxim Systems		March 7, 2017	
7519 East Wilson Ave.			
Seattle, WA 98101-7519			
WE DEBITED YOUR ACCO	DUNT AS FOLLOWS		
10 Server Network Interf	face Cards, your invoice No. 7291,	@90.00	900.00
are being returned via	a parcel post. Our order specified No. 825X.		

The buyer may use the debit memo as the basis for recording the return or allowance or wait for approval from the seller (creditor). In either case, the buyer debits Accounts Payable and credits Merchandise Inventory.

To illustrate, **NetSolutions** records the return of the merchandise indicated in the debit memo in Exhibit 4 as follows:

M	Mar. 7	Accounts Payable—Maxim Systems Merchandise Inventory Debit Memo No. 18.		900	900	
---	--------	---	--	-----	-----	--

Before paying an invoice, a buyer may return merchandise or be granted a price allowance for an invoice with a purchase discount. In this case, the amount of the return is recorded at its invoice amount less the discount.

To illustrate, assume the following data concerning a purchase of merchandise by NetSolutions on May 2:

- May 2. Purchased \$5,000 of merchandise on account from Delta Data Link, terms 2/10, n/30.
 - 4. Returned \$1,000 of the merchandise purchased on May 2.
 - 12. Paid for the purchase of May 2 less the return and discount.

NetSolutions would record these transactions as follows:

May	2	Merchandise Inventory Accounts Payable—Delta Data Link Purchased merchandise. [\$5,000 – (\$5,000 × 2%)]	4,900	4,900	
	4	Accounts Payable—Delta Data Link Merchandise Inventory Returned portion of merch. purchased. $[\$1,000 - (\$1,000 \times 2\%)]$	980	980	
	12	Accounts Payable—Delta Data Link Cash (\$4,900 – \$980)	3,920	3,920	

Example Exercise 5-2 Purchases Transactions



Rofles Company purchased merchandise on account from a supplier for \$11,500, terms 2/10, n/30. Rofles Company returned \$2,500 of the merchandise and received full credit.

- a. If Rofles Company pays the invoice within the discount period, what is the amount of cash required for the payment?
- b. Under a perpetual inventory system, what account is credited by Rofles Company to record the return?

Follow My Example 5-2

- a. \$8,820. Purchase of \$11,270 [\$11,500 (\$11,500 \times 2%)] less the return of \$2,450 [\$2,500 (\$2,500 \times 2%)].
- b. Merchandise Inventory

Practice Exercises: PE 5-2A, PE 5-2B

Sales Transactions

Revenue from merchandise sales is usually recorded as *Sales*. Sometimes a business may use the title *Sales of Merchandise*.

Cash Sales A business may sell merchandise for cash. Cash sales are normally entered on a cash register and recorded in the accounts. To illustrate, assume that on March 3, **NetSolutions** sells merchandise for \$1,800. These cash sales are recorded as follows:

		Journal			Page 25	
Date	•	Description	Post. Ref.	Debit	Credit	
²⁰¹⁷ Mar.	3	Cash Sales To record cash sales.		1,800	1,800	

Using the perpetual inventory system, the cost of merchandise sold and the decrease in merchandise inventory are also recorded. In this way, the merchandise inventory account indicates the amount of merchandise on hand (not sold).

To illustrate, assume that the cost of merchandise sold on March 3 is \$1,200. The entry to record the cost of merchandise sold and the decrease in the merchandise inventory is as follows:

	Mar.	3	Cost of Merchandise Sold Merchandise Inventory To record the cost of merchandise sold.		1,200	1,200	
--	------	---	--	--	-------	-------	--

Sales may be made to customers using credit cards such as MasterCard or VISA. Such sales are recorded as cash sales. This is because these sales are normally processed by a clearinghouse that contacts the bank that issued the card. The issuing bank then electronically transfers cash directly to the retailer's bank account.⁵ Thus, the retailer normally receives cash within a few days of making the credit card sale.

If customers use MasterCards to pay for their purchases, the sales would be recorded exactly as shown in the first March 3 entry illustrated in this section. Any processing fees charged by the clearinghouse or issuing bank are periodically recorded as an

⁵ CyberSource is one of the major credit card clearinghouse. For a more detailed description of how credit card sales are processed, see the following CyberSource Web page: www.cybersource.com, click on Products & Services, click on Global Payment Services, and then click on Credit Card Processing.

MasterCard's or VISA's.

choose not to accept American Express cards. The

As a result, some retailers

disadvantage of this practice

is that the retailer may lose

customers to competitors

who do accept American

Express cards.

expense. This expense is normally reported on the income statement as an administrative expense. To illustrate, assume that NetSolutions paid credit card processing fees of \$4,150 on March 31. These fees would be recorded as follows:



Instead of using MasterCard or VISA, a customer may use a credit card that is not issued by a bank. For example, a customer might use an American Express card. If the seller uses a clearinghouse, the clearinghouse will collect the receivable and transfer the cash to the retailer's bank account, similar to the way it would have if the customer had used MasterCard or VISA. Large businesses, however, may not use a clearinghouse. In such cases, nonbank credit card sales must first be reported to the card company before cash is received. Thus, a receivable is created with the nonbank credit card company. However, because most retailers use clearinghouses to process both bank and nonbank credit cards, all credit card sales will be recorded as cash sales.

Sales on Account A business may sell merchandise on account. The seller records such sales as a debit to Accounts Receivable and a credit to Sales. An example of an entry for a **NetSolutions** sale on account of \$18,000 follows. The cost of merchandise sold was \$10,800.

Mar.	10	Accounts Receivable—Digital Technologies Sales Invoice No. 7172.	18,000	18,000	
	10	Cost of Merchandise Sold Merchandise Inventory Cost of merch. sold on Invoice No. 7172.	10,800	10,800	

Customer Discounts A seller may grant customers a variety of discounts, called **customer discounts**, as incentives to encourage customers to act in a way benefiting the seller. For example, a seller may offer customer discounts to encourage customers to purchase in volume or order early.

A common discount, called a **sales discount**, encourages customers to pay their invoice early. For example, a seller may offer credit terms of 2/10, n/30, which provides a 2% sales discount if the invoice is paid within 10 days. If not paid within 10 days, the total invoice amount is due within 30 days.⁶

To illustrate the accounting for sales discounts, assume that **NetSolutions** sold \$18,000 of merchandise to Digital Technologies on March 10 with credit terms 2/10, n/30. The March 10 sale would be recorded as follows:⁷

N	Mar. 1	O Accounts Receivable—Digital Technologies Sales [\$18,000 – (\$18,000 × 2%)]		17,640	17,640		
---	--------	---	--	--------	--------	--	--

⁶ From the buyer's perspective, a sales discount is referred to as a purchases discount, which was discussed earlier in this chapter.

⁷The accounting for customer discounts other than sales discounts is discussed in advanced accounting courses.

The sale to Digital Technologies is recorded by **NetSolutions** as \$17,640, which is the invoice amount of \$18,000 less the sales discount of \$360 ($$18,000 \times 2\%$).⁸ The payment by Digital Technologies on March 19 is recorded as follows:⁹

Mar. 19 Cash Accounts Receivable—Digital Technologies 17,640 17,640			17,640	
---	--	--	--------	--

Customer Returns and Allowances Merchandise sold may be returned to the seller (returns). In other cases, the seller may reduce the initial selling price (allowances). This might occur if the merchandise is defective, damaged during shipment, or does not meet the buyer's expectations. From a seller's perspective, these are termed **customer returns and allowances**, sometimes called *sales returns and allowances*.

To illustrate the accounting for customer returns and allowances, assume Schafer Co. had sales of \$2,000,000 and related cost of merchandise sold of \$1,400,000 for its first year of operations ending December 31, 2016. Schafer Co. provides customers a refund for any returned or damaged merchandise. At the end of the year, Schafer Co. estimates that customers will request refunds for 2% of sales and estimates that merchandise costing \$25,000 will be returned.

On December 31, 2016, the following two adjusting journal entries must be recorded. 10

Dec.	31	Sales (2% × \$2,000,000) Customer Refunds Payable	40,000	40,000	
	31	Estimated Returns Inventory Cost of Merchandise Sold	25,000	25,000	

The first adjusting entry reduces 2016 Sales by the amount of estimated refunds that may occur in 2017. Since 2% refunds are expected, Sales is debited for \$40,000 ($2\% \times \$2,000,000$). In addition, a liability is recorded for \$40,000 by crediting Customer Refunds Payable for the estimated refunds expected to be paid in 2017.

The second adjusting entry debits the asset Estimated Returns Inventory for the \$25,000 cost of the merchandise that is expected to be returned in 2017. In addition, Cost of Merchandise Sold is credited for \$25,000 for the original cost recorded at the time of sale. The Estimated Returns Inventory account is used since the type of merchandise returned will not be known until the returns actually occur.

The preceding two adjusting entries ensure that current period sales are matched with the related cost of merchandise sold on the income statement. In addition, an asset for estimated returned inventory and a liability for customer refunds is reported on the balance sheet.

To continue the illustration, on January 15, 2017, Baker Company returned merchandise with a selling price of \$3,000 for cash refund. The merchandise originally cost Schafer Co. \$2,100.

Schafer Co. would record the return and refund with the following two entries.

Jan.	15	Customer Refunds Payable Cash	3,000	3,000	
	15	Merchandise Inventory Estimated Returns Inventory	2,100	2,100	

⁸ This is consistent with *Revenue from Contracts with Customers, Topic 606, FASB Accounting Standards Update*, Financial Accounting Standards Board, Norwalk, CT, May 2014.

⁹ To simplify, we assume buyers take all sales discounts.

¹⁰ The accounting illustrated is based upon Revenue from Contracts with Customers, Topic 606, FASB Accounting Standards Update, Financial Accounting Standards Board, Norwalk, CT, May 2014.

The first entry records the cash refund paid Baker Company of \$3,000. The cash paid Baker also reduces the estimated liability for customer refunds payable. The second entry records the cost of the merchandise that was returned of \$2,100. Since the type of merchandise is now known, Merchandise Inventory is debited and Estimated Returns Inventory is credited for \$2,100.¹¹

In some cases, a customer that is due a refund has an outstanding account receivable balance. In this case, the seller may credit the customer's accounts receivable rather than pay cash. When this is done, the seller normally sends the buyer a **credit memorandum**, or **credit memo**, indicating its intent to credit the customer's accounts receivable.

To illustrate, assume that Schafer Company issued the credit memo shown in Exhibit 5 to Blake & Sons. Exhibit 5 indicates that Schafer Company intends to credit Blake & Sons account receivable for \$900 as an allowance for merchandise that was damaged in shipment. Blake & Sons has agreed to keep the merchandise and make any necessary repairs.

EXHIBIT 5

Credit Memo

Schafer C 9004 Madiso Bozeman, M	n Road
CREDIT MEMO	
то	DATE
Blake & Sons	March 4, 2017
7608 Melton Avenue	
Los Angeles, CA 90025-3942	
WE CREDIT YOUR ACCOUNT AS FOLLOWS	
Allowance for merchandise damaged in shipment	900.00

Schafer Co. would record issuance of the credit memo as follows:

	Mar.	4	Customer Refunds Payable	900	000	
			Accounts Receivable—Blake & Sons		900	

The preceding entry reduces the estimated liability Customer Refunds Payable, but credits Blake & Sons' accounts receivable instead of Cash. Since the merchandise was not returned, there is no need to record a second entry for merchandise inventory.

Integrity, Objectivity, and Ethics in Business



THE CASE OF THE FRAUDULENT PRICE TAGS

One of the challenges for a retailer is policing its sales return policy. There are many ways in which customers can unethically or illegally abuse such policies. In one case, a couple was accused of attaching Marshalls' store price tags to cheaper merchandise bought or obtained

elsewhere. The couple then returned the cheaper goods and received the substantially higher refund amount. Company security officials discovered the fraud and had the couple arrested after they had allegedly bilked the company for more than \$1 million.

¹¹ Because of wear, tear, and damage, companies may segregate returned items from normal inventory by using a separate returns inventory account.

Example Exercise 5-3 Sales Transactions



Journalize the following merchandise transactions:

- a. Sold merchandise on account, \$7,500, with terms 2/10, n/30. The cost of the merchandise sold was \$5,625.
- b. Received payment less the discount.

Follow My Example 5-3	
a. Accounts Receivable [\$7,500 – (\$7,500 × 2%)]	7,350
Sales	7,350
Cost of Merchandise Sold	5,625
Merchandise Inventory	5,625
b. Cash	7,350
Accounts Receivable	7,350
	Practice Exercises: PE 5-3A, PE 5-3B

Freight

Purchases and sales of merchandise often involve freight. The terms of a sale indicate when ownership (title and control) of the merchandise passes from the seller to the buyer. This point determines whether the buyer or the seller pays the freight costs.12

The ownership of the merchandise may pass to the buyer when the seller delivers the merchandise to the freight carrier. In this case, the terms are said to be FOB (free on board) shipping point. This term means that the buyer pays the freight costs from the shipping point to the final destination. Such costs are part of the buyer's total cost of purchasing inventory and are added to the cost of the inventory by debiting Merchandise Inventory.

To illustrate, assume that on June 10, NetSolutions purchased merchandise as follows:

- June 10. Purchased merchandise from Magna Data, \$900, terms FOB shipping point.
 - 10. Paid freight of \$50 on June 10 purchase from Magna Data.

NetSolutions would record these two transactions as follows:

June 10	Merchandise Inventory Accounts Payable—Magna Data Purchased merchandise, terms FOB shipping point.	900	900	
10	Merchandise Inventory Cash Paid shipping cost on merchandise purchased.	50	50	

The ownership of the merchandise may pass to the buyer when the buyer receives the merchandise. In this case, the terms are said to be FOB (free on board) **destination**. This term means that the seller pays the freight costs from the shipping Note:

The buyer bears the freight costs if the

shipping terms are

FOB shipping point.

costs if the shipping terms

The seller bears the freight are FOB destination.

¹² The passage of title also determines whether the buyer or seller must pay other costs, such as the cost of insurance, while the merchandise is in transit.

Sometimes FOB

FOB destination

are expressed in terms of a specific location at which

the title to the merchandise passes to the buyer. For example, if **Toyota Motor Corporation**'s assembly plant in Osaka, Japan, sells automobiles to a dealer in Chicago, FOB shipping point is expressed as FOB Osaka. Likewise, FOB destination is expressed as FOB Chicago.

shipping point and

point to the buyer's final destination. When the seller pays the delivery charges, the seller debits Delivery Expense or Freight Out. Delivery Expense is reported on the seller's income statement as a selling expense.

To illustrate, assume that **NetSolutions** sells merchandise as follows:

- June 15. Sold merchandise to Kranz Company on account, \$700, terms FOB destina tion. The cost of the merchandise sold is \$480.
 - 15. NetSolutions pays freight of \$40 on the sale of June 15.

NetSolutions records the sale, the cost of the sale, and the freight cost as follows:

June	15	Accounts Receivable—Kranz Company Sales Sold merchandise, terms FOB destination.	700	700	
	15	Cost of Merchandise Sold Merchandise Inventory Recorded cost of merchandise sold to Kranz Company.	480	480	
	15	Delivery Expense Cash Paid shipping cost on merchandise sold.	40	40	

The seller may prepay the freight, even though the terms are FOB shipping point. The seller will then add the freight to the invoice. The buyer debits Merchandise Inventory for the total amount of the invoice, including the freight. Any discount terms would not apply to the prepaid freight.

To illustrate, assume that **NetSolutions** sells merchandise as follows:

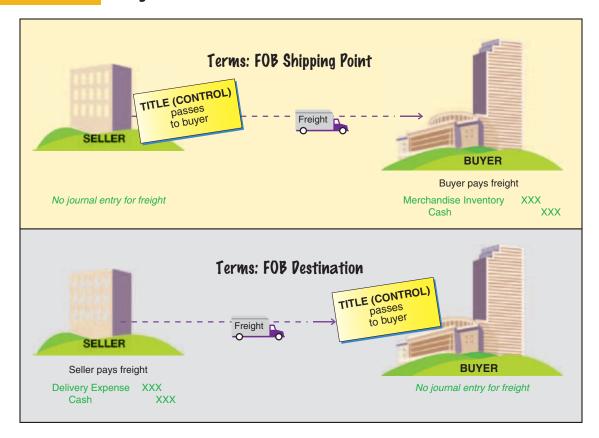
June 20. Sold merchandise to Planter Company on account, \$800, terms FOB shipping point. NetSolutions paid freight of \$45, which was added to the invoice. The cost of the merchandise sold is \$360.

NetSolutions records the sale, the cost of the sale, and the freight as follows:

June	20	Accounts Receivable—Planter Company Sales Sold merchandise, terms FOB shipping point.	800	800	
	20	Cost of Merchandise Sold Merchandise Inventory Recorded cost of merchandise sold to Planter Company.	360	360	
	20	Accounts Receivable—Planter Company Cash Prepaid shipping cost on merchandise sold.	45	45	

Shipping terms, the passage of title (control), and whether the buyer or seller is to pay the freight costs are summarized in Exhibit 6.

Freight Terms



Example Exercise 5-4 Freight Terms



Determine the amount to be paid in full settlement of each of the two invoices, (a) and (b), assuming that credit for returns and allowances was received prior to payment and that all invoices were paid within the discount period.

	Merchandise	Freight Paid by Seller	Freight Terms	Returns and Allowances
a.	\$4,500	\$200	FOB shipping point, 1/10, n/30	\$ 800
b.	5,000	60	FOB destination, 2/10, n/30	2,500

Follow My Example 5-4

- a. \$3,863. Purchase of \$4,455 [$\$4,500 (\$4,500 \times 1\%)$] less return of \$792 [$\$800 (\$800 \times 1\%)$] plus \$200 of shipping.
- b. \$2,450. Purchase of \$4,900 [\$5,000 (\$5,000 \times 2%)] less return of \$2,450 [\$2,500 (\$2,500 \times 2%)].

Practice Exercises: PE 5-4A, PE 5-4B

Summary: Recording Merchandise Inventory Transactions

Recording merchandise inventory transactions under the perpetual inventory system has been described and illustrated in the preceding sections. These transactions involved purchases, purchases returns and allowances, freight, cost of merchandise sold (from sales), and customer returns. Exhibit 7 summarizes how these transactions are recorded in T account form.

Recording Merchandise Inventory Transactions

Purchases (net of discounts) Freight for merchandise purchased FOB shipping point	XXX	Purchases returns and allowances (net of discounts)	XXX
Customer returns	XXX	Cost of merchandise sold	XXX
Estima	ted Ret	urns Inventory	
Adjusting entry for estimated customer returns	xxx	Customer returns	XXX
Cost	of Merc	handise Sold	
		Adjusting entry for estimated	

Dual Nature of Merchandise Transactions

Each merchandising transaction affects a buyer and a seller. In the illustration shown in Exhibit 8, the same transactions for a seller and buyer are recorded. In Exhibit 8, the seller is Scully Company and the buyer is Burton Co.

Example Exercise 5-5 Transactions for Buyer and Seller



Sievert Co. sold merchandise to Bray Co. on account, \$11,500, terms 2/15, n/30. The cost of the merchandise sold is \$6,900. Journalize the entries for Sievert Co. and Bray Co. for the sale, purchase, and payment of amount due.

Follow My	v Evamn	5_5 ما
I CHOW IVE	y Examp	

11,270		
	11,270	
6,900		
	6,900	
11,270		
	11,270	
11,270		
	11,270	
11,270		
	11,270	
	6,900 11,270 11,270	11,270 6,900 6,900 11,270 11,270 11,270 11,270

Practice Exercises: PE 5-5A, PE 5-5B

Illustration of Merchandise Inventory Transactions for Seller and Buyer

Transaction	Scully Company (Sel	ler)		Burton Co. (Buye	r)	
July 1. Scully Company sold merchandise on account to Burton Co., \$7,500, terms FOB shipping point, n/45. The cost of the merchandise sold was \$4,500.	Accounts Receivable—Burton Co Sales	7,500 4,500	7,500 4,500	Merchandise Inventory	7,500	7,500
July 2. Burton Co. paid freight of \$150 on July 1 purchase from Scully Company.	No journal entry.			Merchandise Inventory	150	150
July 5. Scully Company sold merchandise on account to Burton Co., \$5,000, terms FOB destination, n/30. The cost of the merchandise sold was \$3,500.	Accounts Receivable—Burton Co Sales	5,000 3,500	5,000 3,500	Merchandise Inventory	5,000	5,000
July 7. Scully Company paid freight of \$250 for delivery of merchandise sold to Burton Co. on July 5.	Delivery Expense	250	250	No journal entry.		
July 15. Scully Company received payment from Burton Co. for purchase of July 5.	Cash	5,000	5,000	Accounts Payable—Scully Co Cash	5,000	5,000
July 18. Scully Company sold merchandise on account to Burton Co.,\$12,000, terms FOB shipping point, 2/10, n/eom. Scully Company prepaid freight of \$500, which was added to the invoice. The cost of the merchandise sold was \$7,200.	Accounts Receivable—Burton Co Sales	11,760 500 7,200	500 7,200	Merchandise Inventory	12,260	12,260
July 28. Scully Company received payment from Burton Co. for purchase of July 18.	Cash	12,260	12,260	Accounts Payable—Scully Co Cash	12,260	12,260

Chart of Accounts for a Merchandising Business

The chart of accounts for a merchandising business should reflect the types of merchandise transactions described and illustrated earlier in this chapter. The chart of accounts for **NetSolutions** is shown in Exhibit 9. The accounts related to merchandising transactions are highlighted.¹³

As shown in Exhibit 9, NetSolutions' chart of accounts consists of three-digit account numbers. The first digit indicates the major financial statement classification (1 for assets, 2 for liabilities, and so on). The second digit indicates the subclassification

¹³ To simplify, we assume NetSolutions does not accept customer returns and allowances.

Chart of Accounts for NetSolutions, a Merchandising Business

Balance Sheet Accounts	Income Statement Accounts
00 Assets	400 Revenues
110 Cash	410 Sales
112 Accounts Receivable	500 Costs and Expenses
115 Merchandise Inventory	510 Cost of Merchandise Sold
116 Office Supplies	520 Sales Salaries Expense
117 Prepaid Insurance	521 Advertising Expense
120 Land	522 Depreciation Expense—
123 Store Equipment	Store Equipment
124 Accumulated Depreciation—	523 Delivery Expense
Store Equipment	529 Miscellaneous Selling Expense
125 Office Equipment	530 Office Salaries Expense
126 Accumulated Depreciation—	531 Rent Expense
Office Equipment	532 Depreciation Expense—
00 Liabilities	Office Equipment
	533 Insurance Expense
210 Accounts Payable211 Salaries Payable	534 Office Supplies Expense
211 Salaties Payable 212 Unearned Rent	539 Misc. Administrative Expense
215 Notes Payable	600 Other Income
213 Notes rayable	610 Rent Revenue
00 Stockholders' Equity	
310 Common Stock	700 Other Expense
311 Retained Earnings	710 Interest Expense
312 Dividends	
313 Income Summary	

(e.g., 11 for current assets, 12 for noncurrent assets, etc.). The third digit identifies the specific account (e.g., 110 for Cash, 123 for Store Equipment, etc.). Using a three-digit numbering system makes it easier to add new accounts as they are needed.

Sales Taxes and Trade Discounts

Sales of merchandise often involve sales taxes. Also, the seller may offer buyers trade discounts.

Sales Taxes Almost all states levy a tax on sales of merchandise.¹⁴ The liability for the sales tax is incurred when the sale is made.

At the time of a cash sale, the seller collects the sales tax. When a sale is made on account, the seller charges the tax to the buyer by debiting Accounts Receivable. The seller credits the sales account for the amount of the sale and credits the tax to Sales Tax Payable. For example, the seller would record a sale of \$100 on account, subject to a tax of 6%, as follows:

Aug.	12	Accounts Receivable—Lemon Co.	106		
		Sales		100	
		Sales Tax Payable		6	
		Invoice No. 339.			

On a regular basis, the seller pays to the taxing authority (state) the amount of the sales tax collected. The seller records such a payment as follows:

	Sept. 15	Sales Tax Payable Cash Payment for sales taxes collected during August.		2,900	2,900		
--	----------	--	--	-------	-------	--	--

¹⁴ Businesses that purchase merchandise for resale to others are normally exempt from paying sales taxes on their purchases. Only final buyers of merchandise normally pay sales taxes.



Business Connection

SALES TAXES

While there is no federal sales tax, most states have enacted statewide sales taxes. In addition, many states allow counties and cities to collect a "local option" sales tax. Delaware, Montana, New Hampshire, and Oregon have no state or local sales taxes. Tennessee (9.45%), Washington (8.8%), and Louisiana (8.75%) have the highest average combined rates (including state and local option taxes). Several towns in Tuscaloosa County, Alabama, have the highest combined rates in the United States of 11%, while Chicago, Illinois, has the highest combined city rate of 10.25%.

What about companies that sell merchandise through the Internet? The general rule is that if the company ships merchandise to a customer in a state where the company does not have a physical location, no sales tax is due. For example, a customer in Montana who purchases merchandise online from a New York retailer (and no physical location in Montana) does not have to pay sales tax to either Montana or New York.

Source: The Sales Tax Clearinghouse at www.thestc.com/FAQ.stm.

Trade Discounts Wholesalers are companies that sell merchandise to other businesses rather than to the public. Many wholesalers publish sales catalogs. Rather than updating their catalogs, wholesalers may publish price updates. These updates may include large discounts from the catalog list prices. In addition, wholesalers often offer special discounts to government agencies or businesses that order large quantities. Such discounts are called trade discounts.

Sellers and buyers do not normally record the list prices of merchandise and trade discounts in their accounts. For example, assume that an item has a list price of \$1,000 and a 40% trade discount. The seller records the sale of the item at \$600 [\$1,000 less the trade discount of \$400 ($\$1,000 \times 40\%$)]. Likewise, the buyer records the purchase at \$600.

Financial Statements for a Merchandising Business

Describe and illustrate the financial statements of a merchandising business.

Although merchandising transactions affect the balance sheet in reporting inventory, they primarily affect the income statement. An income statement for a merchandising business is normally prepared using either a multiple-step or single-step format.

Multiple-Step Income Statement

The 2017 income statement for **NetSolutions** is shown in Exhibit 10.15 This form of income statement, called a multiple-step income statement, contains several sections, subsections, and subtotals.

Sales The total amount of sales to customers for cash and on account is reported in this section. NetSolutions reported sales of \$708,255 for the year ended December 31, 2017.

Cost of Merchandise Sold As shown in Exhibit 10, NetSolutions reported cost of merchandise sold of \$525,305 during 2017. This amount is the cost of merchandise sold to customers. Cost of merchandise sold may also be reported as cost of goods sold or cost of sales.

Gross Profit The excess of sales over cost of merchandise sold is gross profit. As shown in Exhibit 10, NetSolutions reported gross profit of \$182,950 in 2017.

Income from Operations Income from operations, sometimes called *operating* income, is determined by subtracting operating expenses from gross profit. Operating expenses are normally classified as either selling expenses or administrative expenses.

15 The NetSolutions income statement for 2017 is used because it allows a better illustration of the computation of the cost of merchandise sold in the appendix to this chapter.



For many merchandising businesses,

the cost of merchandise sold is usually the largest expense. For example, the approximate percentage of cost of merchandise sold to sales is 64% for JCPenney and 66% for The Home Depot.

Multiple-Step Income Statement

NetSolutions Income Statement For the Year Ended December 31, 2017							
Sales			\$708,255				
Cost of merchandise sold			525,305				
Gross profit			\$182,950				
Operating expenses:							
Selling expenses:	ć52.420						
Sales salaries expense	\$53,430						
Advertising expense	10,860						
Depreciation expense—store equipment	3,100						
Delivery expense	2,800 630						
Miscellaneous selling expense	030	\$ 70,820					
Administrative expenses:		\$ 70,820					
Office salaries expense	\$21,020						
Rent expense	8,100						
Depreciation expense—office equipment	2,490						
Insurance expense	1,910						
Office supplies expense	610						
Miscellaneous administrative expense	760						
Total administrative expenses		34,890					
Total operating expenses			105,710				
Income from operations			\$ 77,240				
Other income and expense:							
Rent revenue		\$ 600					
Interest expense		(2,440)	(1,840)				
Net income			\$ 75,400				

Selling expenses are incurred directly in the selling of merchandise. Examples of selling expenses include sales salaries, store supplies used, depreciation of store equipment, delivery expense, and advertising.

Administrative expenses, sometimes called general expenses, are incurred in the administration or general operations of the business. Examples of administrative expenses include office salaries, depreciation of office equipment, and office supplies used.

Each selling and administrative expense may be reported separately as shown in Exhibit 10. However, many companies report selling, administrative, and operating expenses as single line items, as follows for NetSolutions:



Gross profit		\$182,950
Operating expenses:		
Selling expenses	\$70,820	
Administrative expenses	34,890	
Total operating expenses		105,710
Income from operations		\$ 77,240

Other Income and Expense Other income and expense items are not related to the primary operations of the business. **Other income** is revenue from sources other than the primary operating activity of a business. Examples of other income include income from interest, rent, and gains resulting from the sale of fixed assets. **Other expense** is an expense that cannot be traced directly to the normal operations of the business. Examples of other expenses include interest expense and losses from disposing of fixed assets.

Other income and other expense are offset against each other on the income statement. If the total of other income exceeds the total of other expense, the difference is added to income from operations to determine net income. If the reverse is true, the difference is subtracted from income from operations. The other income and expense items of NetSolutions are reported as follows and in Exhibit 10:

Income from operations		\$77,240
Other income and expense:		
Rent revenue	\$ 600	
Interest expense	(2,440)	_(1,840)
Net income		\$75,400

Single-Step Income Statement

An alternate form of income statement is the **single-step income statement**. As shown in Exhibit 11, the income statement for **NetSolutions** deducts the total of all expenses *in one step* from the total of all revenues.

The single-step form emphasizes total revenues and total expenses in determining net income. A criticism of the single-step form is that gross profit and income from operations are not reported.

NetSolutions Income Statement For the Year Ended December 31, 2017					
Revenues:					
Sales		\$708,255			
Rent revenue		600			
Total revenues		\$708,855			
Expenses:					
Cost of merchandise sold	\$525,305				
Selling expenses	70,820				
Administrative expenses	34,890				
Interest expense	2,440				
Total expenses		633,455			
Net income		\$ 75,400			

EXHIBIT 11

Single-Step Income Statement

Retained Earnings Statement

The retained earnings statement for **NetSolutions** is shown in Exhibit 12. This statement is prepared in the same manner as for a service business.

NetSolutions Retained Earnings Statement For the Year Ended December 31, 2017	7	
Retained earnings, January 1, 2017	\$75,400	\$128,800
Less dividends	18,000	57,400 \$186,200

EXHIBIT 12

Retained Earnings Statement for Merchandising Business

Balance Sheet

The balance sheet may be presented with assets on the left-hand side and the liabilities and stockholders' equity on the right-hand side. This form of the balance sheet is called the **account form**. The balance sheet may also be presented in a downward sequence in three sections. This form of balance sheet is called the **report form**. The report form of balance sheet for **NetSolutions** is shown in Exhibit 13. In Exhibit 13, merchandise inventory is reported as a current asset and the current portion of the note payable of \$5,000 is reported as a current liability.

Report Form of Balance Sheet

NetSolutions Balance Sheet December 31, 2017										
Assets										
Current assets:										
Cash		\$52,950								
Accounts receivable		91,080								
Merchandise inventory		62,150								
Office supplies		480								
Prepaid insurance		2,650	¢200.210							
Total current assets			\$209,310							
Property, plant, and equipment:		\$20,000								
Land	\$27.100	\$20,000								
Less accumulated depreciation	\$27,100 5,700	21,400								
Office equipment	\$15,570	21,400								
Less accumulated depreciation	4,720	10,850								
Total property, plant, and equipment	4,720	10,030	52,250							
Total assets			\$261,560							
Liabilities			<u> </u>							
Current liabilities:										
Accounts payable		\$22,420								
Note payable (current portion)		5,000								
Salaries payable		1,140								
Unearned rent		1,800								
Total current liabilities			\$ 30,360							
Long-term liabilities:										
Note payable (final payment due in ten years)			20,000							
Total liabilities			\$ 50,360							
Stockholders' Equity										
Common stock		\$ 25,000								
Retained earnings		186,200								
Total stockholders' equity			211,200							
Total liabilities and stockholders' equity			\$261,560							



The Adjusting and Closing Process

Thus far, the recording of transactions, chart of accounts, and financial statements for a merchandising business (NetSolutions) have been described and illustrated. In the remainder of this chapter, the adjusting and closing process for a merchandising business will be described. In this discussion, the focus will be on the elements of the accounting cycle that differ from those of a service business.

Adjusting Entry for Inventory Shrinkage

Under the perpetual inventory system, the merchandise inventory account is continually updated for purchase and sales transactions. As a result, the balance of the merchandise inventory account is the amount of merchandise available for sale at that point in time. However, retailers normally experience some loss of inventory due to shoplifting, employee theft, or errors. Thus, the physical inventory on hand at the end of the accounting period is usually less than the balance of Merchandise Inventory. This difference is called **inventory shrinkage** or **inventory shortage**.

To illustrate, **NetSolutions**' inventory records indicate the following on December 31, 2017:

Account balance of Merchandise Inventory	\$63,950
Physical merchandise inventory on hand	62,150
Inventory shrinkage	\$ 1,800

At the end of the accounting period, inventory shrinkage is recorded by the following adjusting entry:

	Dec. 31	Adjusting Entry Cost of Merchandise Sold Merchandise Inventory Inventory shrinkage (\$63,950 – \$62,150).		1,800	1,800	
--	---------	--	--	-------	-------	--

After the preceding entry is recorded, the balance of Merchandise Inventory agrees with the physical inventory on hand at the end of the period. Since inventory shrinkage cannot be totally eliminated, it is considered a normal cost of operations. If, however, the amount of the shrinkage is unusually large, it may be disclosed separately on the income statement. In such cases, the shrinkage may be recorded in a separate account, such as Loss from Merchandise Inventory Shrinkage.

Integrity, Objectivity, and Ethics in Business



THE COST OF EMPLOYEE THEFT

One survey reported that the 24 largest U.S. retail store chains have lost more than \$6 billion to shoplifting and employee theft. The stores apprehended over 1 million shoplifters and dishonest employees and recovered more than \$161 million from these thieves. Approximately 1 out

of every 36 employees was apprehended for theft from his or her employer. Each dishonest employee stole approximately 6 times the amount stolen by shoplifters (\$665.77 versus \$113.30).

Source: Jack L. Hayes International, 24th Annual Retail Theft Survey, 2012.

Example Exercise 5-6 Inventory Shrinkage





Pulmonary Company's perpetual inventory records indicate that \$382,800 of merchandise should be on hand on March 31, 2016. The physical inventory indicates that \$371,250 of merchandise is actually on hand. Journalize the adjusting entry for the inventory shrinkage for Pulmonary Company for the year ended March 31, 2016. Assume that the inventory shrinkage is a normal amount.

Follow My Example 5-6

Merchandise Inventory.....

Inventory shrinkage (\$382,800 - \$371,250).

11,550

Practice Exercises: PE 5-6A, PE 5-6B

Closing Entries

The closing entries for a merchandising business are similar to those for a service business. The four closing entries for a merchandising business are as follows:

- 1. Debit each temporary account with a credit balance, such as Sales, for its balance and credit Income Summary.
- 2. Credit each temporary account with a debit balance, such as the various expenses, and debit Income Summary. Since Cost of Merchandise Sold is a temporary account with a debit balance, it is credited for its balance.

- 3. Debit Income Summary for the amount of its balance (net income) and credit the retained earnings account. The accounts debited and credited are reversed if there is a net loss.
- 4. Debit the retained earnings account for the balance of the dividends account and credit the dividends account.

The four closing entries for **NetSolutions** follow:

		Journal			Page 29	
Date	2	ltem	Post. Ref.	Debit	Credit	Ī
2017		Closing Entries				
Dec.	31	Sales	410	708,255		
		Rent Revenue	610	600		
		Income Summary	313		708,855	
	31	Income Summary	313	633,455		
		Cost of Merchandise Sold	510		525,305	
		Sales Salaries Expense	520		53,430	
		Advertising Expense	521		10,860	
		Depr. Expense—Store Equipment	522		3,100	
		Delivery Expense	523		2,800	
		Miscellaneous Selling Expense	529		630	
		Office Salaries Expense	530		21,020	
		Rent Expense	531		8,100	
		Depr. Expense—Office Equipment	532		2,490	
		Insurance Expense	533		1,910	
		Office Supplies Expense	534		610	
		Misc. Administrative Expense	539		760	
		Interest Expense	710		2,440	
	31	Income Summary	313	75,400		
		Retained Earnings	311	73,100	75,400	
		netunied Lannings	511		75,400	
	31	Retained Earnings	311	18,000		
		Dividends	312		18,000	

NetSolutions' income summary account after the closing entries have been posted is as follows:

Ac	Account Income Summary Account No. 313									
	Date			Post.			Bala	nce		
			Item	Ref.	Debit	Credit	Debit	Credit		
	²⁰¹⁷ Dec.	31	Revenues	29		708,855		708,855		
		31	Expenses	29	633,455			75,400		
		31	Net income	29	75,400		_	_		

After the closing entries are posted to the accounts, a post-closing trial balance is prepared. The only accounts that should appear on the post-closing trial balance are the asset, contra asset, liability, and stockholders' equity accounts with balances. These are the same accounts that appear on the end-of-period balance sheet. If the two totals of the trial balance columns are not equal, an error has occurred that must be found and corrected.

Financial Analysis and Interpretation: Ratio of Sales to Assets

The **ratio of sales to assets** measures how effectively a business is using its assets to generate sales. A high ratio indicates an effective use of assets. The assets used in computing the ratio may be the total assets at the end of the year, the average of the total assets at the beginning and end of the year, or the average of the monthly assets. For our purposes, the average of the total assets at the beginning and end of the year is used.

The ratio of sales to assets is computed as follows:

Ratio of Sales to Assets =
$$\frac{\text{Sales}}{\text{Average Total Assets}}$$

To illustrate the use of this ratio, the following data (in millions) were taken from recent annual reports of Dollar Tree, Inc.:

	Year 2	Year 1
Total revenues (sales)	\$6,631	\$5,882
Total assets:		
Beginning of year	2,381	2,290
End of year	2,328	2,381

The ratios of sales to assets for each year are as follows:

	Year 2	Year 1
Ratio of sales to assets*	2.82	2.52
	\$6,631 ÷ [(\$2,381 + \$2,328) ÷ 2]	\$5,882 ÷ [(\$2,290 + \$2,381) ÷ 2]

^{*}Rounded to two decimal places.

Based on the preceding ratios, Dollar Tree improved its ratio of sales to assets from 2.52 in Year 1 to 2.82 in Year 2. Thus, Dollar Tree improved the utilization of its assets to generate sales in Year 2.

Using the ratio of sales to assets for comparisons to competitors and with industry averages could also be beneficial in interpreting Dollar Tree's use of its assets. For example, the following data (in millions) were taken from recent annual reports of Dollar General Corporation:

	Year 2
Total revenues (sales)	\$14,807
Total assets:	
Beginning of year	9,546
End of year	9,689

Dollar General's ratio of sales to assets for Year 2 is as follows:

*Rounded to two decimal places.

Comparing Dollar General's Year 2 ratio of 1.54 to Dollar Tree's Year 2 ratio of 2.82 implies that Dollar Tree is using its assets more efficiently than is Dollar General.





Example Exercise 5-7 Ratio of Sales to Assets

Financial statement data for the years ending December 31, 2016 and 2015, for Gilbert Company follow:

	2016	2015
Sales	\$1,305,000	\$962,500
Total assets:		
Beginning of year	840,000	700,000
End of year	900,000	840,000

- a. Determine the ratio of sales to assets for 2016 and 2015.
- b. Does the change in the ratio of sales to assets from 2015 to 2016 indicate a favorable or an unfavorable trend?

Follow My Example 5-7

a.

	2016	2015
Ratio of sales to assets	1.50	1.25
	\$1,305,000 ÷ [(\$840,000 + \$900,000) ÷ 2]	\$962,500 ÷ [(\$700,000 + \$840,000) ÷ 2]

b. The change from 1.25 to 1.50 indicates a favorable trend in using assets to generate sales.

Practice Exercises: PE 5-7A, PE 5-7B

A P P E N D I X

The Periodic Inventory System

Throughout this chapter, the perpetual inventory system was used to record purchases and sales of merchandise. Not all merchandise businesses, however, use the perpetual inventory system. For example, small merchandise businesses, such as a local hardware store, may use a manual accounting system. A manual perpetual inventory system is time consuming and costly to maintain. In this case, the periodic inventory system may be used.

Under the periodic inventory system, purchases are normally recorded at their invoice amount. If the invoice is paid within the discount period, the discount is recorded in a separate account called Purchases Discounts. Likewise, purchases returns are recorded in a separate account called Purchases Returns and Allowances.

Chart of Accounts Under the Periodic Inventory System

The chart of accounts for **NetSolutions** under a periodic inventory system is shown in Exhibit 14. The accounts used to record transactions under the periodic inventory system are highlighted in Exhibit 14.

	Balance Sheet Accounts		Income Statement Accounts
100 Ass	ets	400 Rev	enues
110	Cash	410	Sales
111	Notes Receivable	500 Cos	ts and Expenses
112	Accounts Receivable	<mark>510</mark>	Purchases
115	Merchandise Inventory	<mark>511</mark>	Purchases Returns and
116	Office Supplies		Allowances
117	Prepaid Insurance	512	Purchases Discounts
120	Land	<mark>513</mark>	Freight In
123	Store Equipment	520	Sales Salaries Expense
124	Accumulated Depreciation—	521	Advertising Expense
	Store Equipment	522	Depreciation Expense—
125	Office Equipment		Store Equipment
126	Accumulated Depreciation—	523	Delivery Expense
	Office Equipment	529	Miscellaneous Selling Expense
200 Lia	bilities	530	Office Salaries Expense
210	Accounts Payable	531	Rent Expense
211	Salaries Payable	532	Depreciation Expense—
	Unearned Rent		Office Equipment
215	Notes Payable	533	Insurance Expense
	,	534	Office Supplies Expense
	ckholders' Equity	539	Misc. Administrative Expense
5.0	Common Stock	600 Oth	er Income
	Retained Earnings	000 0 1	Rent Revenue
0.2	Dividends	0.0	
313	Income Summary		er Expense
		710	Interest Expense

EXHIBIT 14

Chart of Accounts Under the Periodic Inventory System

Recording Merchandise Transactions Under the Periodic Inventory System

Using the periodic inventory system, purchases of inventory are not recorded in the merchandise inventory account. Instead, purchases, purchases discounts, and purchases returns and allowances accounts are used. In addition, the sales of merchandise are not recorded in the inventory account. Thus, there is no detailed record of the amount of inventory on hand at any given time. At the end of the period, a physical count of merchandise inventory on hand is taken. This physical count is used to determine the cost of merchandise sold as will be illustrated later.

The use of purchases, purchases discounts, purchases returns and allowances, and freight in accounts are described in this section.

Purchases Purchases of inventory are recorded in a purchases account rather than in the merchandise inventory account. Purchases is debited for the invoice amount of a purchase.

Purchases Discounts Purchases discounts are normally recorded in a separate purchases discounts account. The balance of the purchases discounts account is reported as a deduction from Purchases for the period. Thus, Purchases Discounts is a contra (or offsetting) account to Purchases.

Purchases Returns and Allowances Purchases returns and allowances are recorded in a similar manner as purchases discounts. A separate purchases returns and allowances account is used to record returns and allowances. Purchases returns and allowances are reported as a deduction from Purchases for the period. Thus, Purchases Returns and Allowances is a contra (or offsetting) account to Purchases.

Freight In When merchandise is purchased FOB shipping point, the buyer pays for the freight. Under the periodic inventory system, freight paid when purchasing merchandise FOB shipping point is debited to Freight In, Transportation In, or a similar account.

The preceding periodic inventory accounts and their effect on the cost of merchandise purchased are summarized as follows:

Account	Entry to Increase	Normal Balance	Effect on Cost of Merchandise Purchased
Purchases	Debit	Debit	Increases
Purchases Discounts	Credit	Credit	Decreases
Purchases Returns and Allowances	Credit	Credit	Decreases
Freight In	Debit	Debit	Increases

Exhibit 15 illustrates the recording of merchandise transactions using the periodic system.

Adjusting Process Under the Periodic Inventory System

The adjusting process is the same under the periodic and perpetual inventory systems except for the inventory shrinkage adjustment. The ending merchandise inventory is determined by a physical count under both systems.

Under the perpetual inventory system, the ending inventory physical count is compared to the balance of Merchandise Inventory. The difference is the amount of inventory shrinkage. The inventory shrinkage is then recorded as a debit to Cost of Merchandise Sold and a credit to Merchandise Inventory.

Under the periodic inventory system, the merchandise inventory account is not kept up to date for purchases and sales. As a result, the inventory shrinkage cannot be directly determined. Instead, any inventory shrinkage is included indirectly in the computation of the cost of merchandise sold as shown in Exhibit 14. This is a major disadvantage of the periodic inventory system. That is, under the periodic inventory system, inventory shrinkage is not separately determined.

When the periodic inventory system is used, the cost of merchandise sold is determined as shown in Exhibit 16.

Transaction	Periodic Inventory System	
June 5. Purchased \$30,000 of merchandise on account, terms 2/10, n/30.	Purchases	30,000
June 8. Returned merchandise purchased on account on June 5, \$500.	Accounts Payable	500
June 15. Paid for purchase of June 5, less return of \$500 and discount of \$590 [(\$30,000 – \$500) × 2%].	Accounts Payable	28,910 590
June 18. Sold merchandise on account, \$12,500, 1/10, n/30. The cost of the merchandise sold was \$9,000.	Accounts Receivable [\$12,500 – (\$12,500 × 1%)]	12,375
June 22. Purchased merchandise, \$15,000, terms FOB shipping point, 2/15, n/30, with prepaid freight of \$750 added to the invoice.	Purchases	15,750
June 28. Received payment on account from June 18 sale	Cash	12,375
June 29. Received \$19,600 from cash sales. The cost of the merchandise sold was \$13,800.	Cash	19,600

Transactions
Using the Periodic
Inventory System

Financial Statements Under the Periodic Inventory System

The financial statements are similar under the perpetual and periodic inventory systems. When the multiple-step format of income statement is used, the cost of merchandise sold may be reported as shown in Exhibit 16.

Merchandise inventory, January 1, 2017			\$ 59,70
Purchases		\$521,980	
Less: Purchases returns and allowances	\$9,100		
Purchases discounts	2,525	11,625	
Net purchases		\$510,355	
Add freight in		17,400	
Cost of merchandise purchased			527,75
Merchandise available for sale			\$587,45
Less merchandise inventory, December 31, 2017			62,15
Cost of merchandise sold			\$525,30

EXHIBIT 16

Determining Cost of Merchandise Sold Using the Periodic System

Closing Entries Under the Periodic Inventory System

The closing entries differ in the periodic inventory system in that there is no cost of merchandise sold account to close to Income Summary. Instead, the purchases,

purchases discounts, purchases returns and allowances, and freight in accounts are closed to Income Summary. In addition, the merchandise inventory account is adjusted to the end-of-period physical inventory count during the closing process.

The four closing entries under the periodic inventory system are as follows:

- 1. Debit each temporary account with a credit balance, such as Sales, for its balance and credit Income Summary. Since Purchases Discounts and Purchases Returns and Allowances are temporary accounts with credit balances, they are debited for their balances. In addition, Merchandise Inventory is debited for its end-of-period balance based on the end-of-period physical inventory.
- 2. Credit each temporary account with a debit balance, such as the various expenses, and debit Income Summary. Since Freight In is a temporary account with a debit balance, it is credited for its balance. In addition, Merchandise Inventory is credited for its balance as of the beginning of the period.
- 3. Debit Income Summary for the amount of its balance (net income) and credit the retained earnings account. The accounts debited and credited are reversed if there is a net loss.
- 4. Debit the retained earnings account for the balance of the dividends account and credit the dividends account.

The four closing entries for **NetSolutions** under the periodic inventory system follow:

		Journal			
Dat	e	ltem	Post. Ref.	Debit	Credit
2017		Closing Entries			
Dec.	31	Merchandise Inventory	115	62,150	
		Sales	410	708,255	
		Purchases Returns and Allowances	511	9,100	
		Purchases Discounts	512	2,525	
		Rent Revenue	610	600	
		Income Summary	313		782,630
	31	Income Summary	313	707,230	
		Merchandise Inventory	115		59,700
		Purchases	510		521,980
		Freight In	513		17,400
		Sales Salaries Expense	520		53,430
		Advertising Expense	521		10,860
		Depreciation Expense—Store Equipment	522		3,100
		Delivery Expense	523		2,800
		Miscellaneous Selling Expense	529		630
		Office Salaries Expense	530		21,020
		Rent Expense	531		8,100
		Depreciation Expense—Office Equipment	532		2,490
		Insurance Expense	533		1,910
		Office Supplies Expense	534		610
		Miscellaneous Administrative Expense	539		760
		Interest Expense	710		2,440
	31	Income Summary	313	75,400	
		Retained Earnings	311		75,400
	31	Retained Earnings	311	18,000	
		Dividends	312		18,000

In the first closing entry, Merchandise Inventory is debited for \$62,150. This is the ending physical inventory count on December 31, 2017. In the second closing entry, Merchandise Inventory is credited for its January 1, 2017, balance of \$59,700. In this way, the closing entries highlight the importance of the beginning and ending balances of Merchandise Inventory in determining the cost of merchandise sold, as shown in Exhibit 16. After the closing entries are posted, Merchandise Inventory will have a balance of \$62,150. This is the amount reported on the December 31, 2017, balance sheet.

In the preceding closing entries, the periodic accounts are highlighted. Under the perpetual inventory system, the highlighted periodic inventory accounts are replaced by the cost of merchandise sold account.

At a Glance 5



Distinguish between the activities and financial statements of service and merchandising businesses.

Key Points Merchandising businesses purchase merchandise for selling to customers. On a merchandising business's income statement, revenue from selling merchandise is reported as sales. The cost of the merchandise sold is subtracted from sales to arrive at gross profit. The operating expenses are subtracted from gross profit to arrive at net income. Merchandise inventory, which is merchandise not sold, is reported as a current asset on the balance sheet.

Learning Outcomes	Example Exercises	Practice Exercises
 Describe how the activities of a service and a merchandising business differ. 		
• Describe the differences between the income statements of a service and a merchandising business.		
Compute gross profit.	EE5-1	PE5-1A, 5-1B
• Describe how merchandise inventory is reported on the balance sheet.		



Describe and illustrate the accounting for merchandise transactions.

Key Points Purchases of merchandise for cash or on account are recorded as merchandise inventory. Discounts for early payment of purchases on account are purchases discounts. Purchases of merchandise inventory subject to purchase discounts are recorded net of the discount. Price adjustments or returned merchandise are purchases returns. Price adjustments or returned merchandise are recorded net of any purchase discount.

Sales of merchandise for cash or on account are recorded as sales. The cost of merchandise sold and the reduction in merchandise inventory are also recorded at the time of sale.

A seller may grant customers a variety of discounts, called customer discounts. A sales discount encourages customer to pay their invoice early. Sales subject to a sales discount are recorded net of the discount.

A seller may pay a customer a refund or grant a price allowance for returned or damaged merchandise, called customer returns and allowances. At the end of the accounting period, a seller must record two adjusting entries for expected returns and allowances. The first adjusting entry debits Sales and credits Customer Refunds Payable. The second entry debits Estimated Returns Inventory and credits Cost of Merchandise Sold. When merchandise is returned for a refund, Customer Refunds Payable is debited and Cash is credited for the amount of the refund. The returned merchandise is recorded as a debit to Merchandise Inventory and credit to Estimated Returns Inventory. When a customer doesn't return merchandise, but is granted an allowance Customer Refunds Payable is debited and either Cash, if the customer has already paid for the merchandise, or Account Receivable is credited.

When merchandise is shipped FOB shipping point, the buyer pays the freight and debits Merchandise Inventory. When merchandise is shipped FOB destination, the seller pays the freight and debits Delivery Expense or Freight Out. Merchandise transactions can be summarized in T account form as shown in Exhibit 7. Each merchandising transaction affects a buyer and a seller. The chart of accounts for a merchandising business (NetSolutions) is shown in Exhibit 9. The liability for sales tax is incurred when the sale is made and is recorded by the seller as a credit to the sales tax payable account. Trade discounts are discounts off the list price of merchandise.

Learning Outcomes	Example	Practice
 Prepare journal entries to record the purchases of merchandise for cash. 	Exercises	Exercises
 Prepare journal entries to record the purchases of merchandise on account. 	EE5-2	PE5-2A, 5-2B
 Prepare journal entries to record purchases discounts and purchases returns and allowances. 	EE5-2	PE5-2A, 5-2B
• Prepare journal entries to record sales of merchandise for cash or using a credit card.		
• Prepare journal entries to record sales of merchandise on account.	EE5-3	PE5-3A, 5-3B
 Prepare journal entries to record sales discounts and customer returns and allowances. 	EE5-3	PE5-3A, 5-3B
• Prepare journal entries for freight from the point of view of the buyer and seller.		
 Determine the total cost of the purchase of merchandise under differing freight terms. 	EE5-4	PE5-4A, 5-4B
 Record the same merchandise transactions for the buyer and seller. 	EE5-5	PE5-5A, 5-5B
• Prepare a chart of accounts for a merchandising business.		
 Determine the cost of merchandise purchased when a trade discount is offered by the seller. 		
 Record sales transactions involving sales taxes and trade discounts. 		



Describe and illustrate the financial statements of a merchandising business.

Key Points The multiple-step income statement of a merchandiser reports sales. The cost of the merchandise sold is subtracted from sales to determine the gross profit. Operating income is determined by subtracting selling and administrative expenses from gross profit. Net income is determined by adding or subtracting the net of other income and expense. The income statement may also be reported in a single-step form.

The retained earnings statement is similar to that for a service business.

The balance sheet reports merchandise inventory at the end of the period as a current asset.

Learning Outcomes	Example Exercises	Practice Exercises
 Prepare a multiple-step income statement for a merchandising business. 		
Prepare a single-step income statement.		
 Prepare a retained earnings statement for a merchandising business. 		
Prepare a report form of balance sheet for a merchandising business.		



Describe the adjusting and closing process for a merchandising business.

Key Points The normal adjusting entry for inventory shrinkage is to debit Cost of Merchandise Sold and credit Merchandise Inventory.

The closing entries for a merchandising business are similar to those for a service business except that the cost of merchandise sold is also closed to Income Summary.

Learning Outcomes	Example Exercises	Practice Exercises
Prepare the adjusting journal entry for inventory shrinkage.	EE5-6	PE5-5A, 5-6B
Prepare the closing entries for a merchandising business.		



Describe and illustrate the use of the ratio of sales to assets in evaluating a company's operating performance.

Key Points The ratio of sales to assets measures how effectively a business is using its assets to generate sales. A high ratio indicates an effective use of assets. Using the average of the total assets at the beginning and end of the year, the ratio is computed as follows:

Ratio of Sales to Assets =
$$\frac{\text{Sales}}{\text{Average Total Assets}}$$

Learning Outcomes	Example Exercises	Practice Exercises
• Interpret a high ratio of sales to assets.		
Compute the ratio of sales to assets.	EE5-7	PE5-7A, 5-7B

Key Terms

account form (233) administrative expenses (general expenses) (232) accounts payable subsidiary ledger (216) accounts receivable subsidiary ledger (216) controlling account (216) cost of merchandise sold (215) credit memorandum (credit memo) (224) credit period (217) credit terms (217) customer discounts (222) customer returns and allowances (223) debit memorandum (debit memo) (219)

FOB (free on board) destination (225) FOB (free on board) shipping point (225) general ledger (216) gross profit (215) income from operations (operating income) (231) inventory shrinkage (inventory shortage) (234) inventory subsidiary ledger (216) invoice (217) merchandise inventory (215) multiple-step income statement (231) operating cycle (214) other expense (232) other income (232)

periodic inventory system (217)
perpetual inventory system (217)
physical inventory (217)
purchases discounts (219)
purchases returns and
allowances (219)
ratio of sales to assets (237)
report form (233)
sales (215)
sales discounts (222)
selling expenses (232)
single-step income statement (233)
special journals (216)
subsidiary ledger (216)
trade discounts (231)

Illustrative Problem

The following transactions were completed by Montrose Company during May of the current year. Montrose Company uses a perpetual inventory system.

- May 3. Purchased merchandise on account from Floyd Co., \$4,000, terms FOB shipping point, 2/10, n/30, with prepaid freight of \$120 added to the invoice.
 - 5. Purchased merchandise on account from Kramer Co., \$8,500, terms FOB destination, 1/10, n/30.
 - 6. Sold merchandise on account to C. F. Howell Co., list price \$4,000, trade discount 30%, terms 2/10, n/30. The cost of the merchandise sold was \$1,125.
 - 8. Purchased office supplies for cash, \$150.
 - 10. Returned merchandise purchased on May 5 from Kramer Co., \$1,300.
 - 13. Paid Floyd Co. on account for purchase of May 3.
 - 14. Purchased merchandise for cash, \$10,500.
 - 15. Paid Kramer Co. on account for purchase of May 5, less return of May 10.
 - 16. Received cash on account from sale of May 6 to C. F. Howell Co.
 - 19. Sold merchandise on MasterCard credit cards, \$2,450. The cost of the merchandise sold was \$980.
 - 22. Sold merchandise for cash to Comer Co., \$3,480. The cost of the merchandise sold was \$1,400.
 - 24. Sold merchandise on account to Smith Co., \$4,350. The cost of the merchandise sold was \$1,750.
 - 25. Refunded Comer Co. \$1,480 for returned merchandise from sale on May 22. The cost of the returned merchandise was \$600.
 - 31. Paid a service processing fee of \$140 for MasterCard sales.

Instructions

- 1. Journalize the preceding transactions.
- 2. Journalize the adjusting entry for merchandise inventory shrinkage, \$3,750.

Solution

1.	May	3	Merchandise Inventory [\$4,000 – (\$4,000 \times 2%)] + \$120 Accounts Payable—Floyd Co.	4,040	4,040
		5	Merchandise Inventory [\$8,500 – (\$8,500 × 1%)]	8,415	
			Accounts Payable—Kramer Co.		8,415
		6	Accounts Receivable—C. F. Howell Co.	2,744	
			Sales		2,744
			$[\$4,000 - (30\% \times \$4,000)] = \$2,800$		
		6	$[\$2,800 - (\$2,800 \times 2\%)] = \$2,744$ Cost of Merchandise Sold	1,125	
		U	Merchandise Inventory	1,123	1,125
		8	Office Supplies	150	1,123
			Cash	.50	150
		10	Accounts Payable—Kramer Co. [\$1,300 – (\$1,300 × 1%)]	1,287	
			Merchandise Inventory		1,300
		13	Accounts Payable—Floyd Co.	4,040	,
			Cash		4,040
		14	Merchandise Inventory	10,500	
			Cash		10,500
		15	Accounts Payable—Kramer Co. (\$8,415 – \$1,287)	7,128	
			Cash		7,128
		16	Cash	2,744	
			Accounts Receivable—C. F. Howell Co.		2,744
		19	Cash	2,450	
		10	Sales	000	2,450
		19	Cost of Merchandise Sold	980	980
		22	Merchandise Inventory Cash	3,480	980
		22	Sales	3,400	3,480
		22	Cost of Merchandise Sold	1,400	3,400
			Merchandise Inventory	1,100	1,400
		24	Accounts Receivable—Smith Co.	4,350	.,
			Sales	,	4,350
		24	Cost of Merchandise Sold	1,750	
			Merchandise Inventory		1,750
		25	Customers Refunds Payable	1,480	
			Cash		1,480
		25	Merchandise Inventory	600	
			Estimated Returns Inventory		600
		31	Credit Card Expense	140	
2		24	Cash	2.756	140
2.	May	31	Cost of Merchandise Sold	3,750	2
			Merchandise Inventory		3,750
			Inventory shrinkage.		
			•		

Discussion Questions

- What distinguishes a merchandising business from a service business?
- 2. Can a business earn a gross profit but incur a net loss? Explain.
- 3. The credit period during which the buyer of merchandise is allowed to pay usually begins with what date?
- 4. What is the meaning of (a) 1/15, n/60; (b) n/30; (c) n/eom?
- 5. How are sales to customers using MasterCard and VISA recorded?
- 6. What is the nature of (a) a credit memo issued by the seller of merchandise, (b) a debit memo issued by the buyer of merchandise?
- 7. Who bears the freight when the terms of sale are (a) FOB shipping point, (b) FOB destination?

- 8. Name three accounts that would normally appear in the chart of accounts of a merchandising business but would not appear in the chart of accounts of a service business.
- 9. Audio Outfitter Inc., which uses a perpetual inventory system, experienced a normal inventory shrinkage of \$13,675. What accounts would be debited and credited to record the adjustment for the inventory shrinkage at the end of the accounting period?
- 10. Assume that Audio Outfitter Inc. in Discussion Question 9 experienced an abnormal inventory shrinkage of \$98,600. Audio Outfitter Inc. has decided to record the abnormal inventory shrinkage so that it would be separately disclosed on the income statement. What account would be debited for the abnormal inventory shrinkage?

Practice Exercises

EE 5-1 p. 216 **PE 5-1**

PE 5-1A Gross profit

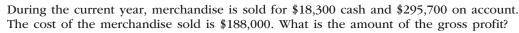
OBJ. 1

During the current year, merchandise is sold for \$615,000 cash and \$4,110,000 on account. The cost of the merchandise sold is \$2,835,000. What is the amount of the gross profit?



EE 5-1 p. 216 PE 5-1B Gross profit

OBJ. 1





EE 5-2 *p. 221* **PE 5-2A** Purchases transactions

OBJ. 2

Halibut Company purchased merchandise on account from a supplier for \$18,600, terms 2/10, n/30. Halibut Company returned \$5,000 of the merchandise and received full credit.

- a. If Halibut Company pays the invoice within the discount period, what is the amount of cash required for the payment?
- b. What account is credited by Halibut Company to record the return?



PE 5-2B Purchases transactions

OBJ. 2

Hoffman Company purchased merchandise on account from a supplier for \$65,000, terms 1/10, n/30. Hoffman Company returned \$7,500 of the merchandise and received full credit.

- a. If Hoffman Company pays the invoice within the discount period, what is the amount of cash required for the payment?
- b. What account is debited by Hoffman Company to record the return?



EE 5-3 p. 225 PE 5-3A Sales transactions

OBJ. 2



Journalize the following merchandise transactions:

- a. Sold merchandise on account, \$72,500 with terms 2/10, n/30. The cost of the merchandise sold was \$43,500.
- b. Received payment less the discount.

EE 5-3 p. 225 PE 5-3B Sales transactions

OBJ. 2



Journalize the following merchandise transactions:

- a. Sold merchandise on account, \$92,500 with terms 1/10, n/30. The cost of the merchandise sold was \$55,500.
- b. Received payment less the discount.

EE 5-4 p. 227 PE 5-4A Freight terms

OBJ. 2



Determine the amount to be paid in full settlement of each of two invoices, (a) and (b), assuming that credit for returns and allowances was received prior to payment and that all invoices were paid within the discount period.

	Merchandise	Freight Paid by Seller	Freight Terms	Returns and Allowances
a.	\$ 90,000	\$1,000	FOB shipping point, 1/10, n/30	\$15,000
b.	110,000	1,575	FOB destination, 2/10, n/30	8,500

EE 5-4 p. 227 PE 5-4B Freight terms

OBJ. 2



Determine the amount to be paid in full settlement of each of two invoices, (a) and (b), assuming that credit for returns and allowances was received prior to payment and that all invoices were paid within the discount period.

	Merchandise	Freight Paid by Seller	Freight Terms	Returns and Allowances
a.	\$36,000	\$800	FOB destination, 1/10, n/30	\$4,000
b.	44,900	375	FOB shipping point, 2/10, n/30	2,400

EE 5-5 p. 228 PE 5-5A Transactions for buyer and seller

OBJ. 2



Sather Co. sold merchandise to Boone Co. on account, \$31,800, terms 2/15, n/30. The cost of the merchandise sold is \$19,000. Journalize the entries for Sather Co. and Boone Co. for the sale, purchase, and payment of amount due.

EE 5-5 p. 228 PE 5-5B Transactions for buyer and seller

OBJ. 2



Shore Co. sold merchandise to Blue Star Co. on account, \$112,000, terms FOB shipping point, 2/10, n/30. The cost of the merchandise sold is \$67,200. Shore Co. paid freight of \$1,800. Journalize the entries for Shore Co. and Blue Star Co. for the sale, purchase, and payment of amount due.

EE 5-6 p. 235 PE 5-6A Inventory shrinkage

OBJ. 4



Castle Furnishings Company's perpetual inventory records indicate that \$675,400 of merchandise should be on hand on November 30, 2016. The physical inventory indicates that \$663,800 of merchandise is actually on hand. Journalize the adjusting entry for the inventory shrinkage for Castle Furnishings Company for the year ended November 30, 2016. Assume that the inventory shrinkage is a normal amount.

EE 5-6 p. 235 PE 5-6B Inventory shrinkage

OBJ. 4



Hahn Flooring Company's perpetual inventory records indicate that \$1,333,150 of merchandise should be on hand on December 31, 2016. The physical inventory indicates that \$1,309,900 of merchandise is actually on hand. Journalize the adjusting entry for the inventory shrinkage for Hahn Flooring Company for the year ended December 31, 2016. Assume that the inventory shrinkage is a normal amount.

EE 5-7 *p. 238*

PE 5-7A Ratio of sales to assets

OBJ. 5







Financial statement data for years ending December 31 for Latchkey Company

	2016	2015
Sales	\$1,734,000	\$1,645,000
Total assets:		
Beginning of year	480,000	460,000
End of year	540,000	480,000

- a. Determine the ratio of sales to assets for 2016 and 2015.
- b. Does the change in the ratio of sales to assets from 2015 to 2016 indicate a favorable or an unfavorable trend?

EE 5-7 p. 238

PE 5-7B Ratio of sales to assets

OBJ. 5







	2016	2015
Sales	\$1,884,000	\$1,562,000
Total assets:		
Beginning of year	770,000	650,000
End of year	800,000	770,000

- a. Determine the ratio of sales to assets for 2016 and 2015.
- b. Does the change in the ratio of sales to assets from 2015 to 2016 indicate a favorable or an unfavorable trend?

Exercises

EX 5-1 Determining gross profit

OBJ. 1



During the current year, merchandise is sold for \$4,885,000. The cost of the merchandise sold is \$3,028,700.

- a. What is the amount of the gross profit?
- b. Compute the gross profit percentage (gross profit divided by sales).
- Will the income statement necessarily report a net income? Explain.



ME HOW



EX 5-2 Determining cost of merchandise sold

OBJ. 1

For a recent year, Best Buy reported sales of \$50,705 million. Its gross profit was \$12,573 million. What was the amount of Best Buy's cost of merchandise sold?

EX 5-3 Purchase-related transactions

OBJ. 2

The Stationery Company purchased merchandise on account from a supplier for \$28,900, terms 1/10, n/30. The Stationery Company returned \$6,100 of the merchandise and received full credit.

- a. What is the amount of cash required for the payment?
- b. Under a perpetual inventory system, what account is credited by The Stationery Company to record the return?

EX 5-4 Purchase-related transactions

OBJ. 2

A retailer is considering the purchase of 250 units of a specific item from either of two suppliers. Their offers are as follows:

Supplier One: \$400 a unit, total of \$100,000, 1/10, n/30, no charge for freight.

Supplier Two: \$399 a unit, total of \$99,750, 2/10, n/30, plus freight of \$975.

Which of the two offers, Supplier One or Supplier Two, yields the lower price?

EX 5-5 Purchase-related transactions

OBJ. 2

The debits and credits from four related transactions are presented in the following T accounts. Describe each transaction.

Cash			Accounts Payable				
		(2)	300	(3)	3,920	(1)	20,580
		(4)	16,660	(4)	16,660		
Merchandise Inventory							
(1)	20,580	(3)	3,920				
(2)	300						

EX 5-6 Purchase-related transactions

OBJ. 2

Warwick's Co., a women's clothing store, purchased \$75,000 of merchandise from a supplier on account, terms FOB destination, 2/10, n/30. Warwick's returned \$9,000 of the merchandise, receiving a credit memo, and then paid the amount due within the discount period. Journalize Warwick's entries to record (a) the purchase, (b) the merchandise return, and (c) the payment.

EX 5-7 Purchase-related transactions

OBJ. 2

Journalize entries for the following related transactions of South Coast Heating & Air Company:

- a. Purchased \$48,000 of merchandise from Atlas Co. on account, terms 1/10, n/30.
- b. Paid the amount owed on the invoice within the discount period.
- c. Discovered that \$7,500 of the merchandise purchased in (a) was defective and returned items, receiving credit.
- d. Purchased \$6,000 of merchandise from Atlas Co. on account, terms n/30.
- e. Received a refund from Atlas Co. for return in (c) less the purchase in (d).

EX 5-8 Sales-related transactions, including the use of credit cards

OBJ. 2

Journalize the entries for the following transactions:

- a. Sold merchandise for cash, \$30,000. The cost of the merchandise sold was \$18,000.
- b. Sold merchandise on account, \$258,000. The cost of the merchandise sold was \$154,800.
- c. Sold merchandise to customers who used MasterCard and VISA, \$160,000. The cost of the merchandise sold was \$96,000.
- d. Sold merchandise to customers who used American Express, \$72,000. The cost of the merchandise sold was \$43,200.
- e. Received an invoice from National Clearing House Credit Co. for \$8,800, representing a service fee paid for processing MasterCard, VISA, and American Express sales.

√ (c) Cash, cr. \$64,680



✓ (e) Cash, dr. \$1,425





EX 5-9 Customer returns and allowances

OBJ. 2

Zell Company had sales of \$1,800,000 and related cost of merchandise sold of \$1,150,000 for its first year of operations ending December 31, 2016. Zell Company provides customers a refund for any returned or damaged merchandise. At the end of the year, Zell Company estimates that customers will request refunds for 1.5% of sales and estimates that merchandise costing \$16,000 will be returned. Assume that on February 3, 2017 Anderson Co. returned merchandise with a selling price of \$5,000 for a cash refund. The returned merchandise originally cost Zell Company \$3,100. (a) Journalize the adjusting entries on December 31, 2016 to record the expected customer returns. (b) Journalize the entries to record the returned merchandise and cash refund to Anderson Co.

EX 5-10 Sales-related transactions

OBJ. 2

After the amount due on a sale of \$28,000, terms 2/10, n/eom, is received from a customer within the discount period, the seller consents to the return of the entire shipment for a cash refund. The cost of the merchandise returned was \$16,800. (a) What is the amount of the refund owed to the customer? (b) Journalize the entries made by the seller to record the return and the refund.

EX 5-11 Sales-related transactions

OBJ. 2

The debits and credits for three related transactions are presented in the following T accounts. Describe each transaction.

	Cash					
(5)	39,200					
	Accounts F	Receivable				
(1)	41,160	(3)	1,960			
		(5)	39,200			
	Merchandis	e Inventory				
(4)	1,200	(2)	25,200			
	Estimated Returns Inventory					
		(4)	1,200			
	Customer Refunds Payable					
(3)	1,960					



✓ c. \$57,470

EX 5-12 Sales-related transactions

OBJ. 2

Merchandise is sold on account to a customer for \$56,500, terms FOB shipping point, 2/10, n/30. The seller paid the freight of \$2,100. Determine the following: (a) amount of the sale, (b) amount debited to Accounts Receivable, and (c) amount received within the discount period.

✓ a. \$22,500

EX 5-13 Determining amounts to be paid on invoices

OBJ. 2



Determine the amount to be paid in full settlement of each of the following invoices, assuming that credit for returns and allowances was received prior to payment and that all invoices were paid within the discount period:

	Merchandise	Freight Paid by Seller		Customer Returns and Allowances
a.	\$27,000	_	FOB destination, n/30	\$4,500
b.	18,600	\$475	FOB shipping point, 2/10, n/30	3,000
c.	8,400	_	FOB shipping point, 1/10, n/30	700
d.	48,300	900	FOB shipping point, 2/10, n/30	6,500
e.	33,000	_	FOB destination, 1/10, n/30	_

SHOW

EX 5-14 Sales-related transactions

OBJ. 2

Showcase Co., a furniture wholesaler, sells merchandise to Balboa Co. on account, \$254,500, terms n/30. The cost of the merchandise sold is \$152,700. Showcase Co. issues a credit memo for \$30,000 for merchandise returned prior to Balboa Co. paying the original invoice. The

cost of the merchandise returned is \$17,500. Journalize Showcase Co.'s entries for (a) the sale, including the cost of the merchandise sold, (b) the credit memo, including the cost of the returned merchandise, and (c) the receipt of the check for the amount due from Balboa Co.

EX 5-15 Purchase-related transactions

OBJ. 2

Based on the data presented in Exercise 5-14, journalize Balboa Co.'s entries for (a) the purchase, (b) the return of the merchandise for credit, and (c) the payment of the invoice.

EX 5-16 Chart of accounts

OBJ. 2

Monet Paints Co. is a newly organized business with a list of accounts arranged in alphabetical order, as follows:

Accounts Payable Miscellaneous Administrative Expense

Accounts Receivable Miscellaneous Selling Expense

Accumulated Depreciation—Office Equipment
Accumulated Depreciation—Store Equipment
Office Equipment
Office Salaries Expense

Cash Office Supplies
Common Stock Office Supplies Expense
Cost of Merchandise Sold Prepaid Insurance
Delivery Expense Rent Expense
Depreciation Expense—Office Equipment Retained Earnings
Depreciation Expense—Store Equipment Salaries Payable

Dividends Sales

Income SummarySales Salaries ExpenseInsurance ExpenseStore EquipmentInterest ExpenseStore SuppliesLandStore Supplies Expense

Merchandise Inventory

Construct a chart of accounts, assigning account numbers and arranging the accounts in balance sheet and income statement order, as illustrated in Exhibit 9. Each account number is three digits: the first digit is to indicate the major classification (1 for assets, and so on); the second digit is to indicate the subclassification (11 for current assets, and so on); and the third digit is to identify the specific account (110 for Cash, 112 for Accounts Receivable, 114 for Merchandise Inventory, 115 for Store Supplies, and so on).

EX 5-17 Sales tax OBJ. 2

A sale of merchandise on account for \$36,000 is subject to an 8% sales tax. (a) Should the sales tax be recorded at the time of sale or when payment is received? (b) What is the amount of the sale? (c) What is the amount debited to Accounts Receivable? (d) What is the title of the account to which the 2,880 ($36,000 \times 8\%$) is credited?

EX 5-18 Sales tax transactions

OBJ. 2

Journalize the entries to record the following selected transactions:

- a. Sold \$62,800 of merchandise on account, subject to a sales tax of 5%. The cost of the merchandise sold was \$37,500.
- b. Paid \$39,650 to the state sales tax department for taxes collected.

EX 5-19 Normal balances of merchandise accounts

OBJ. 2

What is the normal balance of the following accounts: (a) Cost of Merchandise Sold, (b) Customer Refunds Payable, (c) Delivery Expense, (d) Estimated Returns Inventory, (e) Merchandise Inventory, (f) Sales, (g) Sales Tax Payable.



√c. \$38,880







EX 5-20 Income statement and accounts for merchandiser

OBJ. 3

For the fiscal year, sales were \$25,565,000 and the cost of merchandise sold was \$15,400,000.

- a. What was the amount of gross profit?
- b. If total operating expenses were \$4,550,000, could you determine net income?
- c. Is Customer Refunds Payable an asset, liability, or owner's equity account and what is its normal balance?
- d. Is Estimated Returns Inventory an asset, liability, or owner's equity account and what is its normal balance?

EX 5-21 Income statement for merchandiser

OBJ. 3

The following expenses were incurred by a merchandising business during the year. In which expense section of the income statement should each be reported: (a) selling, (b) administrative, or (c) other?

- 1. Advertising expense
- 2. Depreciation expense on store equipment
- 3. Insurance expense on office equipment
- 4. Interest expense on notes payable
- 5. Rent expense on office building
- 6. Salaries of office personnel
- 7. Salary of sales manager
- 8. Sales supplies used

EX 5-22 Determining amounts for items omitted from income statement

OBJ. 3

Two items are omitted in each of the following four lists of income statement data. Determine the amounts of the missing items, identifying them by letter.

Sales	\$463,400	(b)	\$1,295,000	(d)
Cost of merchandise sold	(a)	410,000	(c)	900,000
Gross profit	83,500	\$277,500	275,000	600,000

EX 5-23 Multiple-step income statement

OBJ. 3

On October 31, 2016, the balances of the accounts appearing in the ledger of Prestige Furnishings Company, a furniture wholesaler, are as follows:

Accumulated Depreciation—Building	\$ 750,000	Merchandise Inventory	\$ 980,000
Administrative Expenses	540,000	Notes Payable	250,000
Building	2,500,000	Office Supplies	20,000
Cash	175,000	Retained Earnings	1,287,000
Common Stock	300,000	Salaries Payable	8,000
Cost of Merchandise Sold	3,800,000	Sales	6,410,000
Dividends	175,000	Selling Expenses	715,000
Interest Expense	10,000	Store Supplies	90,000

- a. Prepare a multiple-step income statement for the year ended October 31, 2016.
- b. Compare the major advantages and disadvantages of the multiple-step and single-step forms of income statements.



✓ a. Net income: \$1,345,000





EX 5-24 Multiple-step income statement

OBJ. 3

Identify the errors in the following income statement:

Curbstone Company Income Statement For the Year Ended August 31, 2016

Tot the real Ended August 51, 2010		
Sales	,	\$8,595,000
Cost of merchandise sold		6,110,000
Income from operations		\$2,485,000
Expenses:		
Selling expenses	\$ 800,000	
Administrative expenses	575,000	
Delivery expense	425,000	
Total expenses		1,800,000
		\$ 685,000
Other expense:		
Interest revenue		45,000
Gross profit		\$ 640,000

EX 5-25 Single-step income statement

OBJ. 3

Summary operating data for Custom Wire & Tubing Company during the year ended April 30, 2016, are as follows: cost of merchandise sold, \$6,100,000; administrative expenses, \$740,000; interest expense, \$25,000; rent revenue, \$60,000; sales, \$9,332,500; and selling expenses, \$1,250,000. Prepare a single-step income statement.

EX 5-26 Adjusting entry for merchandise inventory shrinkage

OBJ. 4

Paragon Tire Co.'s perpetual inventory records indicate that \$2,780,000 of merchandise should be on hand on March 31, 2016. The physical inventory indicates that \$2,734,800 of merchandise is actually on hand. Journalize the adjusting entry for the inventory shrinkage for Paragon Tire Co. for the year ended March 31, 2016.

EX 5-27 Closing the accounts of a merchandiser

OBJ. 4

From the following list, identify the accounts that should be closed to Income Summary at the end of the fiscal year under a perpetual inventory system: (a) Accounts Payable, (b) Advertising Expense, (c) Cost of Merchandise Sold, (d) Dividends, (e) Merchandise Inventory, (f) Sales, (g) Supplies, (h) Supplies Expense, (i) Wages Payable.

EX 5-28 Closing entries; net income

OBJ. 4

Based on the data presented in Exercise 5-23, journalize the closing entries.

✓ Net income: \$1,277,500





EX 5-29 Closing entries

OBJ. 4

On July 31, 2016, the balances of the accounts appearing in the ledger of Serbian Interiors Company, a furniture wholesaler, are as follows:

Accumulated Depr.—Building	\$365,000	Notes Payable	\$ 100,000
Administrative Expenses	440,000	Retained Earnings	455,000
Building	810,000	Sales	1,437,000
Cash	78,000	Sales Tax Payable	4,500
Common Stock	75,000	Selling Expenses	160,000
Cost of Merchandise Sold	775,000	Store Supplies	16,000
Dividends	15,000	Store Supplies Expense	21,500
Interest Expense	6,000		
Merchandise Inventory	115,000		

Prepare the July 31, 2016, closing entries for Serbian Interiors Company.

EX 5-30 Ratio of sales to assets

OBJ. 5





The Home Depot reported the following data (in millions) in its recent financial statements:



	Year 2	Year 1
Sales	\$70,395	\$67,997
Total assets at the end of the year	40,518	40,125
Total assets at the beginning of the year	40,125	40,877

- a. Determine the ratio of sales to assets for The Home Depot for Year 2 and Year 1. Round to two decimal places.
- b. What conclusions can be drawn from these ratios concerning the trend in the ability of The Home Depot to effectively use its assets to generate sales?

EX 5-31 Ratio of sales to assets

OBJ. 5



Kroger, a national supermarket chain, reported the following data (in millions) in its financial statements for a recent year:

Total revenue	\$90,374
Total assets at end of year	23,476
Total assets at beginning of year	23.505

- a. Compute the ratio of sales to assets. Round to two decimal places.
- b. Tiffany & Co. is a large North American retailer of jewelry, with a ratio of sales to assets of 0.92. Why would Tiffany's ratio of sales to assets be lower than that of Kroger?

Appendix

EX 5-32 Rules of debit and credit for periodic inventory accounts

Complete the following table by indicating for (a) through (g) whether the proper answer is debit or credit:

Account	Increase	Decrease	Normal Balance
Purchases	debit	(a)	(b)
Purchases Discounts	credit	(c)	credit
Purchases Returns and Allowances	(d)	(e)	(f)
Freight In	debit	(g)	debit



Appendix

EX 5-33 Journal entries using the periodic inventory system

The following selected transactions were completed by Air Systems Company during January of the current year. Air Systems Company uses the periodic inventory system.

- Jan. 2. Purchased \$18,200 of merchandise on account, FOB shipping point, terms 2/15, n/30.
 - 5. Paid freight of \$190 on the January 2 purchase.
 - 6. Returned \$2,750 of the merchandise purchased on January 2.
 - 13. Sold merchandise on account, \$37,300, FOB destination, 1/10, n/30. The cost of merchandise sold was \$22,400.
 - 15. Paid freight of \$215 for the merchandise sold on January 13.
 - 17. Paid for the purchase of January 2 less the return and discount.
 - 23. Received payment on account for the sale of January 13 less the discount.

Journalize the entries to record the transactions of Air Systems Company.

Appendix

EX 5-34 Identify items missing in determining cost of merchandise sold

For (a) through (d), identify the items designated by X and Y.

- a. Purchases -(X + Y) = Net purchases.
- b. Net purchases + X = Cost of merchandise purchased.
- c. Merchandise inventory (beginning) + Cost of merchandise purchased = X.
- d. Merchandise available for sale -X = Cost of merchandise sold.

Appendix

EX 5-35 Cost of merchandise sold and related items

The following data were extracted from the accounting records of Harkins Company for the year ended April 30, 2016:

Merchandise inventory, May 1, 2015	\$ 380,000
Merchandise inventory, April 30, 2016	415,000
Purchases	3,800,000
Purchases returns and allowances	150,000
Purchases discounts	80,000
Sales	5,850,000
Freight in	16 600

- a. Prepare the cost of merchandise sold section of the income statement for the year ended April 30, 2016, using the periodic inventory system.
- b. Determine the gross profit to be reported on the income statement for the year ended April 30, 2016.
- c. Would gross profit be different if the perpetual inventory system was used instead of the periodic inventory system?

Appendix

EX 5-36 Cost of merchandise sold

Based on the following data, determine the cost of merchandise sold for November:

Merchandise inventory, November 1	\$ 28,000
Merchandise inventory, November 30	31,500
Purchases	475,000
Purchases returns and allowances	15,000
Purchases discounts	9,000
Freight in	7,000

✓ a. Cost of merchandise sold, \$3,551,600

Appendix

EX 5-37 Cost of merchandise sold

Based on the following data, determine the cost of merchandise sold for July:

Merchandise inventory, July 1	\$ 190,850
Merchandise inventory, July 31	160,450
Purchases	1,126,000
Purchases returns and allowances	46,000
Purchases discounts	23,000
Freight in	17,500

✓ Correct cost of merchandise sold, \$1,033,300

Appendix

EX 5-38 Cost of merchandise sold

Identify the errors in the following schedule of the cost of merchandise sold for the year ended May 31, 2016:

Cost of merchandise sold:

Merchandise inventory, May 31, 2016			\$ 105,000
Purchases		\$1,110,000	
Plus: Purchases returns and allowances	\$55,000		
Purchases discounts	30,000	85,000	
Gross purchases		\$1,195,000	
Less freight in		22,000	
Cost of merchandise purchased			1,173,000
Merchandise available for sale			\$1,278,000
Less merchandise inventory, June 1, 2015			91,300
Cost of merchandise sold			\$1,186,700

Appendix

EX 5-39 Closing entries using periodic inventory system

United Rug Company is a small rug retailer owned and operated by Pat Kirwan. After the accounts have been adjusted on December 31, the following selected account balances were taken from the ledger:

Advertising Expense	\$	36,000
Depreciation Expense		13,000
Dividends		65,000
Freight In		17,000
Merchandise Inventory, December 1		375,000
Merchandise Inventory, December 31		460,000
Miscellaneous Expense		9,000
Purchases	1	,760,000
Purchases Discounts		35,000
Purchases Returns and Allowances		45,000
Salaries Expense		375,000
Sales	2	,220,000

Journalize the closing entries on December 31.

Problems: Series A

General Ledger

PR 5-1A Purchase-related transactions using perpetual inventory system

OBJ. 2

The following selected transactions were completed by Capers Company during October of the current year:

- Oct. 1. Purchased merchandise from UK Imports Co., \$14,448, terms FOB destination, n/30.
 - 3. Purchased merchandise from Hoagie Co., \$9,950, terms FOB shipping point, 2/10, n/eom. Prepaid freight of \$220 was added to the invoice.
 - 4. Purchased merchandise from Taco Co., \$13,650, terms FOB destination, 2/10, n/30.
 - 6. Issued debit memo to Taco Co. for \$4,550 of merchandise returned from purchase on October 4.
 - 13. Paid Hoagie Co. for invoice of October 3.
 - 14. Paid Taco Co. for invoice of October 4, less debit memo of October 6.
 - 19. Purchased merchandise from Veggie Co., \$27,300, terms FOB shipping point, n/eom.
 - 19. Paid freight of \$400 on October 19 purchase from Veggie Co.
 - 20. Purchased merchandise from Caesar Salad Co., \$22,000, terms FOB destination, 1/10, n/30.
 - 30. Paid Caesar Salad Co. for invoice of October 20.
 - 31. Paid UK Imports Co. for invoice of October 1.
 - 31. Paid Veggie Co. for invoice of October 19.

Instructions

Journalize the entries to record the transactions of Capers Company for October.

X

General Ledger



PR 5-2A Sales-related transactions using perpetual inventory system

OBJ. 2

The following selected transactions were completed by Amsterdam Supply Co., which sells office supplies primarily to wholesalers and occasionally to retail customers:

- Mar. 2. Sold merchandise on account to Equinox Co., \$18,900, terms FOB destination, 1/10, n/30. The cost of the merchandise sold was \$13,300.
 - 3. Sold merchandise for \$11,350 plus 6% sales tax to retail cash customers. The cost of merchandise sold was \$7,000.
 - 4. Sold merchandise on account to Empire Co., \$55,400, terms FOB shipping point, n/eom. The cost of merchandise sold was \$33,200.
 - 5. Sold merchandise for \$30,000 plus 6% sales tax to retail customers who used MasterCard. The cost of merchandise sold was \$19,400.
 - 12. Received check for amount due from Equinox Co. for sale on March 2.
 - 14. Sold merchandise to customers who used American Express cards, \$13,700. The cost of merchandise sold was \$8,350.
 - 16. Sold merchandise on account to Targhee Co., \$27,500, terms FOB shipping point, 1/10, n/30. The cost of merchandise sold was \$16,000.
 - 18. Issued credit memo for \$4,800 to Targhee Co. for merchandise returned from sale on March 16. The cost of the merchandise returned was \$2,900.
 - 19. Sold merchandise on account to Vista Co., \$8,250, terms FOB shipping point, 2/10, n/30. Added \$75 to the invoice for prepaid freight. The cost of merchandise sold was \$5,000.
 - Received check for amount due from Targhee Co. for sale on March 16 less credit memo of March 18.

(Continued)

- Mar. 28. Received check for amount due from Vista Co. for sale of March 19.
 - 31. Received check for amount due from Empire Co. for sale of March 4.
 - 31. Paid Fleetwood Delivery Service \$5,600 for merchandise delivered during March to customers under shipping terms of FOB destination.
- Apr. 3. Paid City Bank \$940 for service fees for handling MasterCard and American Express sales during March.
 - 15. Paid \$6,544 to state sales tax division for taxes owed on sales.

Instructions

Journalize the entries to record the transactions of Amsterdam Supply Co.

PR 5-3A Sales-related and purchase-related transactions using perpetual inventory system

The following were selected from among the transactions completed by Babcock Company during November of the current year:

- Nov. 3. Purchased merchandise on account from Moonlight Co., list price \$85,000, trade discount 25%, terms FOB destination, 2/10, n/30.
 - 4. Sold merchandise for cash, \$37,680. The cost of the merchandise sold was \$22,600.

OBJ. 2

- 5. Purchased merchandise on account from Papoose Creek Co., \$47,500, terms FOB shipping point, 2/10, n/30, with prepaid freight of \$810 added to the invoice.
- 6. Returned \$13,500 (\$18,000 list price less trade discount of 25%) of merchandise purchased on November 3 from Moonlight Co.
- 8. Sold merchandise on account to Quinn Co., \$15,600 with terms n/15. The cost of the merchandise sold was \$9,400.
- 13. Paid Moonlight Co. on account for purchase of November 3, less return of November 6.
- 14. Sold merchandise on VISA, \$236,000. The cost of the merchandise sold was \$140.000.
- 15. Paid Papoose Creek Co. on account for purchase of November 5.
- 23. Received cash on account from sale of November 8 to Quinn Co.
- 24. Sold merchandise on account to Rabel Co., \$56,900, terms 1/10, n/30. The cost of the merchandise sold was \$34,000.
- 28. Paid VISA service fee of \$3,540.
- 30. Paid Quinn Co. a cash refund of \$6,000 for returned merchandise from sale of November 8. The cost of the returned merchandise was \$3,300.

Instructions

Journalize the transactions.

PR 5-4A Sales-related and purchase-related transactions for seller and buyer using perpetual inventory system

The following selected transactions were completed during August between Summit Company and Beartooth Co.:

- Aug. 1. Summit Company sold merchandise on account to Beartooth Co., \$48,000, terms FOB destination, 2/15, n/eom. The cost of the merchandise sold was \$28,800.
 - 2. Summit Company paid freight of \$1,150 for delivery of merchandise sold to Beartooth Co. on August 1.
 - 5. Summit Company sold merchandise on account to Beartooth Co., \$66,000, terms FOB shipping point, n/eom. The cost of the merchandise sold was \$40,000.
 - 9. Beartooth Co. paid freight of \$2,300 on August 5 purchase from Summit Company.

General Ledger



- Aug. 15. Summit Company sold merchandise on account to Beartooth Co., \$58,700, terms FOB shipping point, 1/10, n/30. Summit Company paid freight of \$1,675, which was added to the invoice. The cost of the merchandise sold was \$35,000.
 - 16. Beartooth Co. paid Summit Company for purchase of August 1.
 - 25. Beartooth Co. paid Summit Company on account for purchase of August 15.
 - 31. Beartooth Co. paid Summit Company on account for purchase of August 5.

Instructions

Journalize the August transactions for (1) Summit Company and (2) Beartooth Co.

✓ 1. Net income \$943,400



General Ledger

PR 5-5A Multiple-step income statement and report form of balance sheet

OBJ. 3

The following selected accounts and their current balances appear in the ledger of Clairemont Co. for the fiscal year ended May 31, 2016:

Cash	\$ 240,000	Dividends	\$ 100,000
Accounts Receivable	966,000	Sales	11,343,000
Merchandise Inventory	1,712,500	Cost of Merchandise Sold	7,850,000
Office Supplies	13,500	Sales Salaries Expense	916,000
Prepaid Insurance	8,000	Advertising Expense	550,000
Office Equipment	830,000	Depreciation Expense—	
Accumulated Depreciation—		Store Equipment	140,000
Office Equipment	550,000	Miscellaneous Selling Expense	38,000
Store Equipment	3,600,000	Office Salaries Expense	650,000
Accumulated Depreciation—		Rent Expense	94,000
Store Equipment	1,820,000	Depreciation Expense—	
Accounts Payable	366,000	Office Equipment	50,000
Salaries Payable	41,500	Insurance Expense	48,000
Note Payable		Office Supplies Expense	28,100
(final payment due 2022)	300,000	Miscellaneous Administrative Exp.	14,500
Common Stock	500,000	Interest Expense	21,000
Retained Earnings	2,949,100		

Instructions

- 1. Prepare a multiple-step income statement.
- 2. Prepare a retained earnings statement.
- 3. Prepare a report form of balance sheet, assuming that the current portion of the note payable is \$50,000.
- 4. Briefly explain (a) how multiple-step and single-step income statements differ and (b) how report-form and account-form balance sheets differ.

PR 5-6A Single-step income statement and account form of balance sheet

OBJ. 3

Selected accounts and related amounts for Clairemont Co. for the fiscal year ended May 31, 2016, are presented in Problem 5-5A.

Instructions

- 1. Prepare a single-step income statement in the format shown in Exhibit 11.
- 2. Prepare a retained earnings statement.
- 3. Prepare an account form of balance sheet, assuming that the current portion of the note payable is \$50,000.
- 4. Prepare closing entries as of May 31, 2016.

✓ 3. Total assets: \$5,000,000



Appendix

PR 5-7A Purchase-related transactions using periodic inventory system

Selected transactions for Capers Company during October of the current year are listed in Problem 5-1A.

Instructions

Journalize the entries to record the transactions of Capers Company for October using the periodic inventory system.

Appendix

PR 5-8A Sales-related and purchase-related transactions using periodic inventory system

Selected transactions for Babcock Company during November of the current year are listed in Problem 5-3A.

Instructions

Journalize the entries to record the transactions of Babcock Company for November using the periodic inventory system.

Appendix

Sales-related and purchase-related transactions for buyer and seller using PR 5-9A periodic inventory system

Selected transactions during August between Summit Company and Beartooth Co. are listed in Problem 5-4A.

Instructions

Journalize the entries to record the transactions for (1) Summit Company and (2) Beartooth Co., assuming that both companies use the periodic inventory system.

Appendix

PR 5-10A Periodic inventory accounts, multiple-step income statement, closing entries

On December 31, 2016, the balances of the accounts appearing in the ledger of Wyman Company are as follows:

Cash	\$ 13,500	Purchases	\$2,650,000
Accounts Receivable	72,000	Purchases Returns and Allowances	93,000
Merchandise Inventory,		Purchases Discounts	37,000
January 1, 2016	257,000	Freight In	48,000
Office Supplies	3,000	Sales Salaries Expense	300,000
Prepaid Insurance	4,500	Advertising Expense	45,000
Land	150,000	Delivery Expense	9,000
Store Equipment	270,000	Depreciation Expense—	
Accumulated Depreciation—		Store Equipment	6,000
Store Equipment	55,900	Miscellaneous Selling Expense	12,000
Office Equipment	78,500	Office Salaries Expense	175,000
Accumulated Depreciation—		Rent Expense	28,000
Office Equipment	16,000	Insurance Expense	3,000
Accounts Payable	27,800	Office Supplies Expense	2,000
Salaries Payable	3,000	Depreciation Expense—	
Unearned Rent	8,300	Office Equipment	1,500
Notes Payable	50,000	Miscellaneous Administrative Expense	3,500
Common Stock	150,000	Rent Revenue	7,000
Retained Earnings	430,500	Interest Expense	2,000
Dividends	25,000		
Sales	3,280,000		

✓ 2. Net income, \$180,000



Instructions

- 1. Does Wyman Company use a periodic or perpetual inventory system? Explain.
- 2. Prepare a multiple-step income statement for Wyman Company for the year ended December 31, 2016. The merchandise inventory as of December 31, 2016, was \$305,000.
- 3. Prepare the closing entries for Wyman Company as of December 31, 2016.
- 4. What would be the net income if the perpetual inventory system had been used?

Problems: Series B

General Ledger

PR 5-1B Purchase-related transactions using perpetual inventory system

OBJ. 2

The following selected transactions were completed by Niles Co. during March of the current year:

- Mar. 1. Purchased merchandise from Haas Co., \$43,250, terms FOB shipping point, 2/10, n/eom. Prepaid freight of \$650 was added to the invoice.
 - 5. Purchased merchandise from Whitman Co., \$19,175, terms FOB destination, n/30.
 - 10. Paid Haas Co. for invoice of March 1.
 - 13. Purchased merchandise from Jost Co., \$15,550, terms FOB destination, 2/10, n/30.
 - 14. Issued debit memo to Jost Co. for \$3,750 of merchandise returned from purchase on March 13.
 - 18. Purchased merchandise from Fairhurst Company, \$13,560, terms FOB shipping point, n/eom.
 - 18. Paid freight of \$140 on March 18 purchase from Fairhurst Company.
 - 19. Purchased merchandise from Bickle Co., \$6,500, terms FOB destination, 2/10, n/30.
 - 23. Paid Jost Co. for invoice of March 13, less debit memo of March 14.
 - 29. Paid Bickle Co. for invoice of March 19.
 - 31. Paid Fairhurst Company for invoice of March 18.
 - 31. Paid Whitman Co. for invoice of March 5.

Instructions

Journalize the entries to record the transactions of Niles Co. for March.

X

General Ledger



PR 5-2B Sales-related transactions using perpetual inventory system

OBJ. 2

The following selected transactions were completed by Green Lawn Supplies Co., which sells irrigation supplies primarily to wholesalers and occasionally to retail customers:

- July 1. Sold merchandise on account to Landscapes Co., \$33,450, terms FOB shipping point, n/eom. The cost of merchandise sold was \$20,000.
 - 2. Sold merchandise for \$86,000 plus 8% sales tax to retail cash customers. The cost of merchandise sold was \$51,600.
 - 5. Sold merchandise on account to Peacock Company, \$17,500, terms FOB destination, 1/10, n/30. The cost of merchandise sold was \$10,000.
 - 8. Sold merchandise for \$112,000 plus 8% sales tax to retail customers who used VISA cards. The cost of merchandise sold was \$67,200.
 - 13. Sold merchandise to customers who used MasterCard cards, \$96,000. The cost of merchandise sold was \$57,600.
 - 14. Sold merchandise on account to Loeb Co., \$16,000, terms FOB shipping point, 1/10, n/30. The cost of merchandise sold was \$9,000.
 - 15. Received check for amount due from Peacock Company for sale on July 5.
 - 16. Issued credit memo for \$3,000 to Loeb Co. for merchandise returned from sale on July 14. The cost of the merchandise returned was \$1,800.
 - 18. Sold merchandise on account to Jennings Company, \$11,350, terms FOB shipping point, 2/10, n/30. Paid \$475 for freight and added it to the invoice. The cost of merchandise sold was \$6,800.
 - 24. Received check for amount due from Loeb Co. for sale on July 14 less credit memo of July 16.
 - 28. Received check for amount due from Jennings Company for sale of July 18.
 - 31. Paid Black Lab Delivery Service \$8,550 for merchandise delivered during July to customers under shipping terms of FOB destination.

(Continued)

- July 31. Received check for amount due from Landscapes Co. for sale of July 1.
- Aug. 3. Paid Hays Federal Bank \$3,770 for service fees for handling MasterCard and VISA sales during July.
 - 10. Paid \$41,260 to state sales tax division for taxes owed on sales.

Instructions

Journalize the entries to record the transactions of Green Lawn Supplies Co.

PR 5-3B Sales-related and purchase-related transactions using perpetual inventory system

OBJ. 2

The following were selected from among the transactions completed by Essex Company during July of the current year:

- July 3. Purchased merchandise on account from Hamling Co., list price \$72,000, trade discount 15%, terms FOB shipping point, 2/10, n/30, with prepaid freight of \$1,450 added to the invoice.
 - 5. Purchased merchandise on account from Kester Co., \$33,450, terms FOB destination, 2/10, n/30.
 - 6. Sold merchandise on account to Parsley Co., \$36,000, terms n/15. The cost of the merchandise sold was \$25,000.
 - 7. Returned \$6,850 of merchandise purchased on July 5 from Kester Co.
 - 13. Paid Hamling Co. on account for purchase of July 3.
 - 15. Paid Kester Co. on account for purchase of July 5, less return of July 7.
 - 21. Received cash on account from sale of July 6 to Parsley Co.
 - 21. Sold merchandise on MasterCard, \$108,000. The cost of the merchandise sold was \$64,800.
 - 22. Sold merchandise on account to Tabor Co., \$16,650, terms 2/10, n/30. The cost of the merchandise sold was \$10,000.
 - 23. Sold merchandise for cash, \$91,200. The cost of the merchandise sold was \$55,000.
 - 28. Paid Parsley Co. a cash refund of \$7,150 for returned merchandise from sale of July 6. The cost of the returned merchandise was \$4,250.
 - 31. Paid MasterCard service fee of \$1,650.

Instructions

Journalize the transactions.

PR 5-4B Sales-related and purchase-related transactions for seller and buyer using perpetual inventory system

OBJ. 2

The following selected transactions were completed during April between Swan Company and Bird Company:

- Apr. 2. Swan Company sold merchandise on account to Bird Company, \$32,000, terms FOB shipping point, 2/10, n/30. Swan Company paid freight of \$330, which was added to the invoice. The cost of the merchandise sold was \$19,200.
 - 8. Swan Company sold merchandise on account to Bird Company, \$49,500, terms FOB destination, 1/15, n/eom. The cost of the merchandise sold was \$29,700.
 - 8. Swan Company paid freight of \$710 for delivery of merchandise sold to Bird Company on April 8.
 - 12. Bird Company paid Swan Company for purchase of April 2.
 - 23. Bird Company paid Swan Company for purchase of April 8.
 - 24. Swan Company sold merchandise on account to Bird Company, \$67,350, terms FOB shipping point, n/eom. The cost of the merchandise sold was \$40,400.

General Ledger



- Apr. 26. Bird Company paid freight of \$875 on April 24 purchase from Swan Company.
 - 30. Bird Company paid Swan Company on account for purchase of April 24.

Instructions

Journalize the April transactions for (1) Swan Company and (2) Bird Company.

PR 5-5B Multiple-step income statement and report form of balance sheet

OBJ. 3

The following selected accounts and their current balances appear in the ledger of Kanpur Co. for the fiscal year ended June 30, 2016:

Cash	\$ 92,000	Dividends	\$ 300,000
Accounts Receivable	450,000	Sales	8,925,000
Merchandise Inventory	375,000	Cost of Merchandise Sold	5,620,000
Office Supplies	10,000	Sales Salaries Expense	850,000
Prepaid Insurance	12,000	Advertising Expense	420,000
Office Equipment	220,000	Depreciation Expense—	
Accumulated Depreciation—		Store Equipment	33,000
Office Equipment	58,000	Miscellaneous Selling Expense	18,000
Store Equipment	650,000	Office Salaries Expense	540,000
Accumulated Depreciation—		Rent Expense	48,000
Store Equipment	87,500	Insurance Expense	24,000
Accounts Payable	48,500	Depreciation Expense—	
Salaries Payable	4,000	Office Equipment	10,000
Note Payable		Office Supplies Expense	4,000
(final payment due 2032)	140,000	Miscellaneous Administrative Exp.	6,000
Common Stock	50,000	Interest Expense	12,000
Retained Earnings	381,000		

Instructions

- 1. Prepare a multiple-step income statement.
- 2. Prepare a retained earnings statement.
- 3. Prepare a report form of balance sheet, assuming that the current portion of the note payable is \$7,000.
- 4. Briefly explain (a) how multiple-step and single-step income statements differ and (b) how report-form and account-form balance sheets differ.

PR 5-6B Single-step income statement and account form of balance sheet

OBJ. 3

Selected accounts and related amounts for Kanpur Co. for the fiscal year ended June 30, 2016, are presented in Problem 5-5B.

Instructions

- 1. Prepare a single-step income statement in the format shown in Exhibit 11.
- 2. Prepare a retained earnings statement.
- 3. Prepare an account form of balance sheet, assuming that the current portion of the note payable is \$7,000.
- 4. Prepare closing entries as of June 30, 2016.

Appendix

PR 5-7B Purchase-related transactions using periodic inventory system

Selected transactions for Niles Co. during March of the current year are listed in Problem 5-1B.

Instructions

Journalize the entries to record the transactions of Niles Co. for March using the periodic inventory system.

✓ 1. Net income: \$1,340,000



General Ledger

✓ 3. Total assets: \$1.663.500



Appendix

PR 5-8B Sales-related and purchase-related transactions using periodic inventory system

Selected transactions for Essex Company during July of the current year are listed in Problem 5-3B.

Instructions

Journalize the entries to record the transactions of Essex Company for July using the periodic inventory system.

Appendix

PR 5-9B Sales-related and purchase-related transactions for buyer and seller using periodic inventory system

Selected transactions during April between Swan Company and Bird Company are listed in Problem 5-4B.

Instructions

Journalize the entries to record the transactions for (1) Swan Company and (2) Bird Company assuming that both companies use the periodic inventory system.

Appendix

PR 5-10B Periodic inventory accounts, multiple-step income statement, closing entries

On June 30, 2016, the balances of the accounts appearing in the ledger of Simkins Company are as follows:



Cash	\$ 125,000) Purchases	\$4,100,000
Accounts Receivable	340,000		32,000
	•		•
Merchandise Inventory, July 1, 2015	415,000		13,000
Office Supplies	9,000) Freight In	45,000
Prepaid Insurance	18,000	Sales Salaries Expense	580,000
Land	300,000	Advertising Expense	315,000
Store Equipment	550,000	Delivery Expense	18,000
Accumulated Depreciation—		Depreciation Expense—	
Store Equipment	190,000	Store Equipment	12,000
Office Equipment	250,000	Miscellaneous Selling Expense	28,000
Accumulated Depreciation—		Office Salaries Expense	375,000
Office Equipment	110,000	Rent Expense	43,000
Accounts Payable	85,000	Insurance Expense	17,000
Salaries Payable	9,000	Office Supplies Expense	5,000
Unearned Rent	6,000	Depreciation Expense—	
Notes Payable	50,000	Office Equipment	4,000
Common Stock	300,000	Miscellaneous Administrative Expense	16,000
Retained Earnings	525,000	Rent Revenue	32,500
Dividends	275,000	Interest Expense	2,500
Sales	6,590,000)	

Instructions

- 1. Does Simkins Company use a periodic or perpetual inventory system? Explain.
- 2. Prepare a multiple-step income statement for Simkins Company for the year ended June 30, 2016. The merchandise inventory as of June 30, 2016, was \$508,000.
- 3. Prepare the closing entries for Simkins Company as of June 30, 2016.
- 4. What would be the net income if the perpetual inventory system had been used?



Continuing Problem

✓ 8. Net income: \$741,855 Palisade Creek Co. is a merchandising business that uses the perpetual inventory system. The account balances for Palisade Creek Co. as of May 1, 2016 (unless otherwise indicated), are as follows:

110	Cash	\$	83,600
112	Accounts Receivable		233,900
115	Merchandise Inventory		624,400
116	Estimated Returns Inventory		28,000
117	Prepaid Insurance		16,800
118	Store Supplies		11,400
123	Store Equipment		569,500
124	Accumulated Depreciation—Store Equipment		56,700
210	Accounts Payable		96,600
211	Salaries Payable		_
212	Customers Refunds Payable		50,000
310	Common Stock		100,000
311	Retained Earnings		585,300
312	Dividends		135,000
313	Income Summary		_
410	Sales	5	,069,000
510	Cost of Merchandise Sold	2	,823,000
520	Sales Salaries Expense		664,800
521	Advertising Expense		281,000
522	Depreciation Expense		_
523	Store Supplies Expense		_
529	Miscellaneous Selling Expense		12,600
530	Office Salaries Expense		382,100
531	Rent Expense		83,700
532	Insurance Expense		_
539	Miscellaneous Administrative Expense		7,800

During May, the last month of the fiscal year, the following transactions were completed:

- May 1. Paid rent for May, \$5,000.
 - 3. Purchased merchandise on account from Martin Co., terms 2/10, n/30, FOB shipping point, \$36,000.
 - 4. Paid freight on purchase of May 3, \$600.
 - 6. Sold merchandise on account to Korman Co., terms 2/10, n/30, FOB shipping point, \$68,500. The cost of the merchandise sold was \$41,000.
 - 7. Received \$22,300 cash from Halstad Co. on account.
 - 10. Sold merchandise for cash, \$54,000. The cost of the merchandise sold was \$32,000.
 - 13. Paid for merchandise purchased on May 3.
 - 15. Paid advertising expense for last half of May, \$11,000.
 - 16. Received cash from sale of May 6.
 - 19. Purchased merchandise for cash, \$18,700.
 - 19. Paid \$33,450 to Buttons Co. on account.
 - 20. Paid Korman Co. a cash refund of \$13,230 for returned merchandise from sale of May 6. The invoice amount of the returned merchandise was \$13,500 and the cost of the returned merchandise was \$8,000.
 - Record the following transactions on Page 21 of the journal:
 - 20. Sold merchandise on account to Crescent Co., terms 1/10, n/30, FOB shipping point, \$110,000. The cost of the merchandise sold was \$70,000.
 - 21. For the convenience of Crescent Co., paid freight on sale of May 20, \$2,300.
 - 21. Received \$42,900 cash from Gee Co. on account.

(Continued)

- May 21. Purchased merchandise on account from Osterman Co., terms 1/10, n/30, FOB destination, \$88,000.
 - 24. Returned of damaged merchandise purchased on May 21, receiving a credit memo from the seller for \$5,000.
 - 26. Refunded cash on sales made for cash, \$7,500. The cost of the merchandise returned was \$4,800.
 - 28. Paid sales salaries of \$56,000 and office salaries of \$29,000.
 - 29. Purchased store supplies for cash, \$2,400.
 - 30. Sold merchandise on account to Turner Co., terms 2/10, n/30, FOB shipping point, \$78,750. The cost of the merchandise sold was \$47,000.
 - 30. Received cash from sale of May 20 plus freight paid on May 21.
 - 31. Paid for purchase of May 21, less return of May 24.

Instructions

- 1. Enter the balances of each of the accounts in the appropriate balance column of a four-column account. Write *Balance* in the item section, and place a check mark (✓) in the Posting Reference column. Journalize the transactions for July, starting on Page 20 of the journal.
- 2. Post the journal to the general ledger, extending the month-end balances to the appropriate balance columns after all posting is completed. In this problem, you are not required to update or post to the accounts receivable and accounts payable subsidiary ledgers.
- 3. Prepare an unadjusted trial balance.
- 4. At the end of May, the following adjustment data were assembled. Analyze and use these data to complete (5) and (6).

a.	Merchandise inventory on May 31		\$570,000
b.	Insurance expired during the year		12,000
c.	Store supplies on hand on May 31		4,000
d.	Depreciation for the current year		14,000
e.	Accrued salaries on May 31:		
	Sales salaries	\$7,000	
	Office salaries	6,600	13,600

- f. The adjustment for customer returns and allowances is \$60,000 for sales and \$35,000 for cost of merchandise sold.
- 5. (Optional) Enter the unadjusted trial balance on a 10-column end-of-period spread-sheet (work sheet), and complete the spreadsheet.
- 6. Journalize and post the adjusting entries. Record the adjusting entries on Page 22 of the journal.
- 7. Prepare an adjusted trial balance.
- 8. Prepare an income statement, a retained earnings statement, and a balance sheet.
- 9. Prepare and post the closing entries. Record the closing entries on Page 23 of the journal. Indicate closed accounts by inserting a line in both the Balance columns opposite the closing entry. Insert the new balance in the retained earnings account.
- 10. Prepare a post-closing trial balance.

Cases & Projects



CP 5-1 Ethics and professional conduct in business

On April 18, 2016, Bontanica Company, a garden retailer, purchased \$9,800 of seed, terms 2/10, n/30, from Whitetail Seed Co. Even though the discount period had expired, Shelby Davey subtracted the discount of \$196 when he processed the documents for payment on May 1, 2016.

Discuss whether Shelby Davey behaved in a professional manner by subtracting the discount, even though the discount period had expired.

CP 5-2 Purchases discounts and accounts payable

Rustic Furniture Co. is owned and operated by Cam Pfeifer. The following is an excerpt from a conversation between Cam Pfeifer and Mitzi Wheeler, the chief accountant for Rustic Furniture Co:

Cam: Mitzi, I've got a question about this recent balance sheet.

Mitzi: Sure, what's your question?

Cam: Well, as you know, I'm applying for a bank loan to finance our new store in Garden Grove, and I noticed that the accounts payable are listed as \$320,000.

Mitzi: That's right. Approximately \$275,000 of that represents amounts due our suppliers, and the remainder is miscellaneous payables to creditors for utilities, office equipment, supplies, etc.

Cam: That's what I thought. But as you know, we normally receive a 2% discount from our suppliers for earlier payment, and we always try to take the discount.

Mitzi: That's right. I can't remember the last time we missed a discount.

Cam: Well, in that case, it seems to me the accounts payable should be listed minus the 2% discount. Let's list the accounts payable due suppliers as \$314,500, rather than \$320,000. Every little bit helps. You never know. It might make the difference between getting the loan and not.



How would you respond to Cam Pfeifer's request?

CP 5-3 Determining cost of purchase

The following is an excerpt from a conversation between Mark Loomis and Krista Huff. Mark is debating whether to buy a stereo system from Tru-Sound Systems, a locally owned electronics store, or Wholesale Stereo, an online electronics company.

Mark: Krista, I don't know what to do about buying my new stereo.

Krista: What's the problem?

Mark: Well, I can buy it locally at Tru-Sound Systems for \$1,175.00. However, Wholesale Stereo has the same system listed for \$1,200.00.

Krista: What's the big deal? Buy it from Tru-Sound Systems.

Mark: It's not quite that simple. Wholesale Stereo charges \$49.99 for shipping and handling. If I have them send it next-day air, it'll cost \$89.99 for shipping and handling.

Krista: So?

Mark: But, that's not all. Tru-Sound Systems will give an additional 2% discount if I pay cash. Otherwise, they will let me use my VISA, or I can pay it off in three monthly installments. In addition, if I buy it from Tru-Sound Systems, I have to pay 9% sales tax. I won't have to pay sales tax if I buy it from Wholesale Stereo, since they are out of state.

Krista: Anything else???

Mark: Well . . . Wholesale Stereo says I have to charge it on my VISA. They don't accept checks.

Krista: I am not surprised. Many online stores don't accept checks.

Mark: I give up. What would you do?

- 1. Assuming that Wholesale Stereo doesn't charge sales tax on the sale to Mark, which company is offering the best buy?
- What might be some considerations other than price that might influence Mark's decision on where to buy the stereo system?

CP 5-4 Sales discounts

Your sister operates Watercraft Supply Company, an online boat parts distributorship that is in its third year of operation. The following income statement was recently prepared for the year ended October 31, 2016:

Watercraft Supply Company Income Statement For the Year Ended October 31, 2016

Tof the leaf Effact October 31, 2010		
Revenues:	,	
Sales		\$1,350,000
Interest revenue		15,000
Total revenues		\$1,365,000
Expenses:		
Cost of merchandise sold	\$810,000	
Selling expenses	140,000	
Administrative expenses	90,000	
Interest expense	4,000	
Total expenses		1,044,000
Net income		\$ 321,000

Your sister is considering a proposal to increase net income by offering sales discounts of 2/15, n/30, and by shipping all merchandise FOB shipping point. Currently, no sales discounts are allowed and merchandise is shipped FOB destination. It is estimated that these credit terms will increase sales by 10%. The ratio of the cost of merchandise sold to sales is expected to be 60%. All selling and administrative expenses are expected to remain unchanged, except for store supplies, miscellaneous selling, office supplies, and miscellaneous administrative expenses, which are expected to increase proportionately with increased sales. The amounts of these preceding items for the year ended October 31, 2016, were as follows:

Store supplies expense	\$12,000
Miscellaneous selling expense	6,000
Office supplies expense	3,000
Miscellaneous administrative expense	2,500

The other income and other expense items will remain unchanged. The shipment of all merchandise FOB shipping point will eliminate all delivery expenses, which for the year ended October 31, 2016, were \$12,000.

- 1. Prepare a projected single-step income statement for the year ending October 31, 2017, based on the proposal. Assume all sales are collected within the discount period.
- 2. a. Based on the projected income statement in (1), would you recommend the implementation of the proposed changes?
 - b. Describe any possible concerns you may have related to the proposed changes described in (1).

CP 5-5 Shopping for a television

Group Project

Assume that you are planning to purchase a 55-inch LED, LCD flat-screen television. In groups of three or four, determine the lowest cost for the television, considering the available alternatives and the advantages and disadvantages of each alternative. For example, you could purchase locally, through mail order, or through an Internet shopping service. Consider such factors as delivery charges, interest-free financing, discounts, coupons, and availability of warranty services. Prepare a report for presentation to the class.



Inventories

Best Buy

Assume that in September you purchased a Sony HDTV from Best Buy. At the same time, you purchased a Denon surround sound system for \$399.99. You liked your surround sound so well that in November you purchased an identical Denon system on sale for \$349.99 for your bedroom TV. Over the holidays, you moved to a new apartment and in the process of unpacking discovered that one of the Denon surround sound systems was missing. Luckily, your renters or homeowners insurance policy will cover the theft; but the insurance company needs to know the cost of the system that was stolen.

The Denon systems were identical. However, to respond to the insurance company, you will need to identify which system was stolen. Was it the first system, which cost \$399.99, or was it the second system, which cost \$349.99? Whichever assumption you make may determine the amount that you receive from the insurance company.

Merchandising businesses such as Best Buy make similar assumptions when identical merchandise is purchased at different costs. For example, Best Buy may have purchased thousands of Denon surround sound systems over the past year at different costs. At the end of a period, some of the Denon systems will still be in inventory, and some will have been sold. But which costs relate to the sold systems, and which costs relate to the Denon systems still in inventory? Best Buy's assumption about inventory costs can involve large dollar amounts and, thus, can have a significant impact on the financial statements. For example, Best Buy reported \$5,731 million of inventory and net loss of \$1,231 million for a recent year.

This chapter discusses such issues as how to determine the cost of merchandise in inventory and the cost of merchandise sold. However, this chapter begins by discussing the importance of control over inventory.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe the importance of control over inventory. Control of Inventory Safeguarding Inventory Reporting Inventory	
Describe three inventory cost flow assumptions and how they impact the income statement and balance sheet. Inventory Cost Flow Assumptions	EE 6-1
Determine the cost of inventory under the perpetual inventory system, using the FIFO, LIFO, and weighted average cost methods. Inventory Costing Methods Under a Perpetual Inventory System First-In, First-Out Method Last-In, First-Out Method Weighted Average Cost Method Computerized Perpetual Inventory Systems	EE 6-2 EE 6-3 EE 6-4
Determine the cost of inventory under the periodic inventory system, using the FIFO, LIFO, and weighted average cost methods. Inventory Costing Methods Under a Periodic Inventory System First-In, First-Out Method Last-In, First-Out Method Weighted Average Cost Method	EE 6-5 EE 6-5 EE 6-5
Compare and contrast the use of the three inventory costing methods. Comparing Inventory Costing Methods	
Describe and illustrate the reporting of merchandise inventory in the financial statements. Reporting Merchandise Inventory in the Financial Statements Valuation at Lower of Cost or Market Merchandise Inventory on the Balance Sheet Effect of Inventory Errors on the Financial Statements	EE 6-6 EE 6-7
Describe and illustrate the inventory turnover and the number of days' sales in inventory in analyzing the efficiency and effectiveness of inventory management. Financial Analysis and Interpretation: Inventory Turnover and Number of Days' Sales in Inventory	EE 6-8
At a Glance	6 Page 294



Control of Inventory

Two primary objectives of control over inventory are as follows:1

- Safeguarding the inventory from damage or theft.
- Reporting inventory in the financial statements.

Safeguarding Inventory

Controls for safeguarding inventory begin as soon as the inventory is ordered. The following documents are often used for inventory control:

- Purchase order
- Receiving report
- Vendor's invoice

The **purchase order** authorizes the purchase of the inventory from an approved vendor. As soon as the inventory is received, a receiving report is completed. The **receiving report** establishes an initial record of the receipt of the inventory. To make sure the inventory received is what was ordered, the receiving report is compared

¹ Additional controls used by businesses are described and illustrated in Chapter 7, "Sarbanes-Oxley, Internal Control, and Cash."

with the purchase order. The price, quantity, and description of the item on the purchase order and receiving report are then compared to the vendor's invoice. If the receiving report, purchase order, and vendor's invoice agree, the inventory is recorded in the accounting records. If any differences exist, they should be investigated and reconciled.

Recording inventory using a perpetual inventory system is also an effective means of control. The amount of inventory is always available in the **subsidiary inventory ledger**. This helps keep inventory quantities at proper levels. For example, comparing inventory quantities with maximum and minimum levels allows for the timely reordering of inventory and prevents ordering excess inventory.

Finally, controls for safeguarding inventory should include security measures to prevent damage and customer or employee theft. Some examples of security measures include the following:

- Storing inventory in areas that are restricted to only authorized employees
- Locking high-priced inventory in cabinets
- · Using two-way mirrors, cameras, security tags, and guards

Reporting Inventory

A physical inventory or *count of inventory* should be taken near year-end to make sure that the quantity of inventory reported in the financial statements is accurate. After the quantity of inventory on hand is determined, the cost of the inventory is assigned for reporting in the financial statements. Most companies assign costs to inventory using one of three inventory cost flow assumptions. If a physical count is not possible or inventory records are not available, the inventory cost may be estimated as described in the appendix at the end of this chapter.

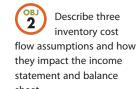
Inventory Cost Flow Assumptions

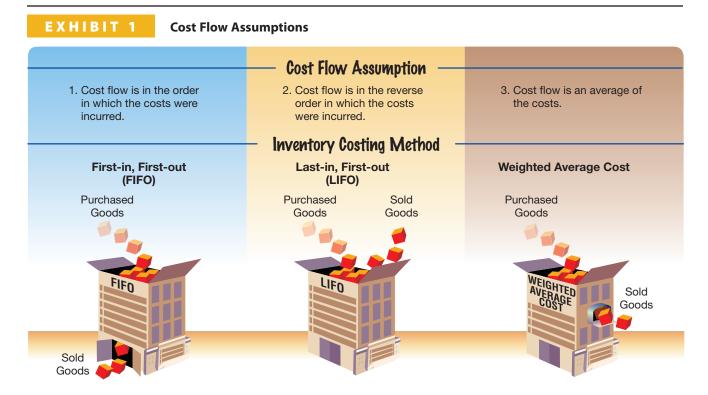
An accounting issue arises when identical units of merchandise are acquired at different unit costs during a period. In such cases, when an item is sold, it is necessary to determine its cost using a cost flow assumption and related inventory costing method. Three common cost flow assumptions and related inventory costing methods are shown in Exhibit 1.



Best Buy uses scanners to screen customers as

they leave the store for merchandise that has not been purchased. In addition, Best Buy stations greeters at the store's entrance to keep customers from bringing in bags that can be used to shoplift merchandise.





To illustrate, assume that three identical units of merchandise are purchased during May, as follows:

			Units	Cost
May	10	Purchase	1	\$ 9
	18	Purchase	1	13
	24	Purchase	<u>1</u>	14
Total			3	\$36

Average cost per unit: \$12 (\$36 ÷ 3 units)

Assume that one unit is sold on May 30 for \$20. Depending upon which unit was sold, the gross profit varies from \$11 to \$6, computed as follows:

	May 10 Unit Sold	May 18 Unit Sold	May 24 Unit Sold
Sales	\$20	\$20	\$20
Cost of merchandise sold	9	13	14
Gross profit	<u>\$11</u>	<u>\$ 7</u>	<u>\$ 6</u>
Ending inventory	\$11 \$27	\$23	\$ 6 \$22
	(\$13 + \$14)	(\$9 + \$14)	(\$9 + \$13)

Under the **specific identification inventory cost flow method**, the unit sold is identified with a specific purchase. The ending inventory is made up of the remaining units on hand. Thus, the gross profit, cost of merchandise sold, and ending inventory can vary as illustrated. For example, if the May 18 unit was sold, the cost of merchandise sold is \$13, the gross profit is \$7, and the ending inventory is \$23.

The specific identification method is not practical unless each inventory unit can be separately identified. For example, an automobile dealer may use the specific identification method because each automobile has a unique serial number. However, most businesses cannot identify each inventory unit separately. In such cases, one of the following three inventory cost flow methods is used.

Under the **first-in, first-out (FIFO) inventory cost flow method**, the first units purchased are assumed to be sold and the ending inventory is made up of the most recent purchases. In the preceding example, the May 10 unit would be assumed to have been sold. Thus, the gross profit would be \$11, and the ending inventory would be \$27 (\$13 + \$14).

Under the **last-in, first-out (LIFO) inventory cost flow method**, the last units purchased are assumed to be sold and the ending inventory is made up of the first purchases. In the preceding example, the May 24 unit would be assumed to have been sold. Thus, the gross profit would be \$6, and the ending inventory would be 22 (\$9 + \$13).

Under the **weighted average inventory cost flow method**, sometimes called the *average cost flow method*, the cost of the units sold and in ending inventory is a weighted average of the purchase costs. The purchase costs are weighted by the quantities purchased at each cost, thus the term *weighted average*. In the preceding example, the cost of the unit sold would be \$12 ($$36 \div 3$ units$), the gross profit would be \$8 (\$20 - \$12), and the ending inventory would be \$24 ($$12 \times 2$ units$). In this example, the purchase costs are weighted equally, since the same quantity (one) was purchased at each cost.

The three inventory cost flow methods, FIFO, LIFO, and weighted average, are shown in Exhibit 2. The frequency with which the FIFO, LIFO, and weighted average methods are used is shown in Exhibit 3.



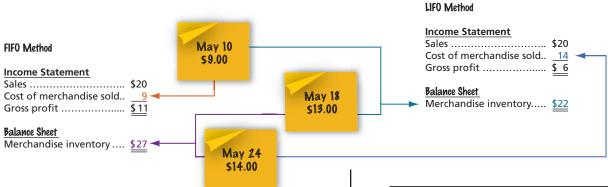
The specific identification method is normally automobile

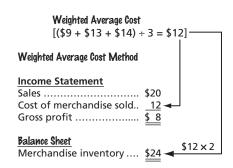
used by automobile dealerships, jewelry stores, and art galleries.

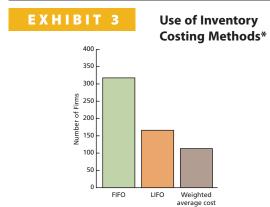
EXHIBIT 2

Inventory Costing Methods

Purchases







*Firms may be counted more than once for using multiple methods. Source: *Accounting Trends and Techniques*, 66th edition, 2012 (New York: American Institute of Certified Public Accountants).

Example Exercise 6-1 Cost Flow Methods



The following three identical units of Item QBM are purchased during February:

		Item QBM	Units	Cost
Feb.	8	Purchase	1	\$ 45
	15	Purchase	1	48
	26	Purchase	<u>1</u>	51
	Total		3	\$144
	Average	e cost per unit	_	$\frac{$48}{}$ (\$144 ÷ 3 units)

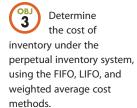
Assume that one unit is sold on February 27 for \$70.

Determine the gross profit for February and ending inventory on February 28 using the (a) first-in, first-out (FIFO); (b) last-in, first-out (LIFO); and (c) weighted average cost methods.

Follow My Example 6-1

a. First-in, first-out (FIFO)		Gross Profit	Ending Inventory
, , , , , , , , , , , , , , , , , , , ,	a. First-in, first-out (FIFO)	\$25 (\$70 – \$45)	\$99 (\$48 + \$51)
c. Weighted average cost	b. Last-in, first-out (LIFO)	\$19 (\$70 – \$51)	\$93 (\$45 + \$48)
	c. Weighted average cost	\$22 (\$70 – \$48)	\$96 (\$48 × 2)

Practice Exercises: PE 6-1A, PE 6-1B





Although e-tailers, such as eToys
Direct, Inc.,

Amazon.com, and Furniture.com, Inc., don't have retail stores, they still take possession of inventory in warehouses. Thus, they must account for inventory as illustrated in this chapter.

Inventory Costing Methods Under a Perpetual Inventory System

As illustrated in the prior section, when identical units of an item are purchased at different unit costs, an inventory cost flow method must be used. This is true regardless of whether the perpetual or periodic inventory system is used.

In this section, the FIFO, LIFO, and weighted average cost methods are illustrated under a perpetual inventory system. For purposes of illustration, the following data for Item 127B are used:

	ltem 127B	Units	Cost
Jan. 1	Inventory	1,000	\$20.00
4	Sale at \$30 per unit	700	
10	Purchase	500	22.40
22	Sale at \$30 per unit	360	
28	Sale at \$30 per unit	240	
30	Purchase	600	23.30

First-In, First-Out Method

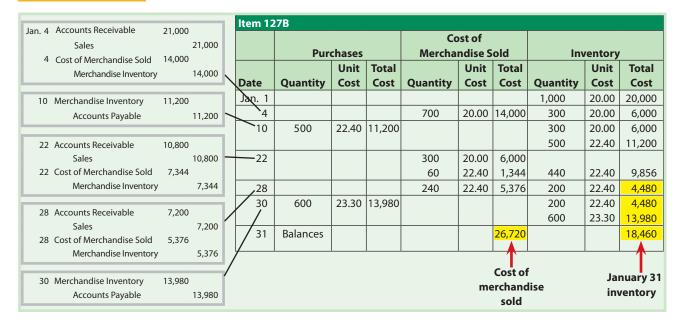
When the FIFO method is used, costs are included in the cost of merchandise sold in the order in which they were purchased. This is often the same as the physical flow of the merchandise. Thus, the FIFO method often provides results that are about the same as those that would have been obtained using the specific identification method. For example, grocery stores shelve milk and other perishable products by expiration dates. Products with early expiration dates are stocked in front. In this way, the oldest products (earliest purchases) are sold first.

To illustrate, Exhibit 4 shows the use of FIFO under a perpetual inventory system for Item 127B. The journal entries and the subsidiary inventory ledger for Item 127B are shown in Exhibit 4 as follows:

- 1. The beginning balance on January 1 is \$20,000 (1,000 units at a unit cost of \$20).
- 2. On January 4, 700 units were sold at a price of \$30 each for sales of \$21,000 (700 units at a selling price of \$30 per unit). The cost of merchandise sold is \$14,000 (700 units at a unit cost of \$20). After the sale, there remains \$6,000 of inventory (300 units at a unit cost of \$20).

EXHIBIT 4

Entries and Perpetual Inventory Account (FIFO)



- 3. On January 10, \$11,200 is purchased (500 units at a unit cost of \$22.40). After the purchase, the inventory is reported on two lines, \$6,000 (300 units at a unit cost of \$20.00) from the beginning inventory and \$11,200 (500 units at a unit cost of \$22.40) from the January 10 purchase.
- 4. On January 22, 360 units are sold at a price of \$30 each for sales of \$10,800 (360 units at a selling price of \$30 per unit). Using FIFO, the cost of merchandise sold of \$7,344 consists of \$6,000 (300 units at a unit cost of \$20.00) from the beginning inventory plus \$1,344 (60 units at a unit cost of \$22.40) from the January 10 purchase. After the sale, there remains \$9,856 of inventory (440 units at a unit cost of \$22.40) from the January 10 purchase.
- 5. The January 28 sale and January 30 purchase are recorded in a similar manner.
- 6. The ending balance on January 31 is \$18,460. This balance is made up of two layers of inventory as follows:

	Date of		Unit	Total
	Purchase	Quantity	Cost	Cost
Layer 1:	Jan. 10	200	\$22.40	\$ 4,480
Layer 2:	Jan. 30	600	23.30	13,980
Total		800		\$18,460

Example Exercise 6-2 Perpetual Inventory Using FIFO



Beginning inventory, purchases, and sales for Item ER27 are as follows:

Nov. 1	Inventory	40 units at \$5
5	Sale	30 units
11	Purchase	70 units at \$7
21	Sale	36 units

Assuming a perpetual inventory system and using the first-in, first-out (FIFO) method, determine (a) the cost of merchandise sold on November 21 and (b) the inventory on November 30.

Follow My Example 6-2

a. Cost of merchandise sold (November 21): b. Inventory, November 30: $10 \text{ units at } \$5 \qquad \$50 \qquad \$308 \text{ (44 units } \times \$7)$ $\frac{26}{36} \text{ units at } \$7 \qquad \frac{182}{\$232}$

Practice Exercises: PE 6-2A, PE 6-2B

Last-In, First-Out Method

When the LIFO method is used, the cost of the units sold is the cost of the most recent purchases. The LIFO method was originally used in those rare cases where the units sold were taken from the most recently purchased units. However, for tax purposes, LIFO is now widely used even when it does not represent the physical flow of units. The tax impact of LIFO is discussed later in this chapter.

See Appendix C for more information.

To illustrate, Exhibit 5 shows the use of LIFO under a perpetual inventory system for Item 127B. The journal entries and the subsidiary inventory ledger for Item 127B are shown in Exhibit 5 as follows:

- 1. The beginning balance on January 1 is \$20,000 (1,000 units at a unit of cost of \$20.00).
- 2. On January 4, 700 units were sold at a price of \$30 each for sales of \$21,000 (700 units at a selling price of \$30 per unit). The cost of merchandise sold is \$14,000 (700 units at a unit cost of \$20). After the sale, there remains \$6,000 of inventory (300 units at a unit cost of \$20).
- 3. On January 10, \$11,200 is purchased (500 units at a unit cost of \$22.40). After the purchase, the inventory is reported on two lines, \$6,000 (300 units at a unit cost of \$20.00) from the beginning inventory and \$11,200 (500 units at \$22.40 per unit) from the January 10 purchase.
- 4. On January 22, 360 units are sold at a price of \$30 each for sales of \$10,800 (360 units at a selling price of \$30 per unit). Using LIFO, the cost of merchandise sold is \$8,064 (360 units at unit cost of \$22.40) from the January 10 purchase. After the sale, there remains

EXHIBIT 5

Entries and Perpetual Inventory Account (LIFO)

Jan. 4	Accounts Receivable	21,000		Item 12									
	Sales		21,000						st of				
4	Cost of Merchandise Sold	14,000			Pur	chases		Mercha	ndise S	old	Inv	entory	
	Merchandise Inventory		14,000			Unit	Total		Unit	Total		Unit	Total
	·			Date	Quantity	Cost	Cost	Quantity	Cost	Cost	Quantity	Cost	Cost
10	Merchandise Inventory	11,200		Jan. 1							1,000	20.00	20,00
	Accounts Payable		11,200	4				700	20.00	14,000	300	20.00	6,000
				10	500	22.40	11,200				300	20.00	6,00
22	Accounts Receivable	10,800									500	22.40	11,20
	Sales		10,800 -	22				360	22.40	8,064	300	20.00	6,00
22	Cost of Merchandise Sold	8,064									140	22.40	3,13
	Merchandise Inventory		8,064	,28				140	22.40	3,136	200	20.00	4,00
								100	20.00	2,000			
28	Accounts Receivable	7,200	·/	30	600	23.30	13,980				200	20.00	4,00
20	Sales	- 404	7,200								600	23.30	13,98
28	Cost of Merchandise Sold	5,136	5 126										
	Merchandise Inventory		5,136	31	Balances					27,200			17,98
30	Merchandise Inventory	13,980								1			1
	Accounts Payable		13,980							C 4 - 4			١,
										Cost of			nuary 3
									me	erchand sold	iise	inv	entory

\$9,136 of inventory consisting of \$6,000 (300 units at a unit cost of \$20.00) from the beginning inventory and \$3,136 (140 units at a unit cost of \$22.40) from the January 10 purchase.

- 5. The January 28 sale and January 30 purchase are recorded in a similar manner.
- 6. The ending balance on January 31 is \$17,980. This balance is made up of two layers of inventory as follows:

	Date of		Unit	Total
	Purchase	Quantity	Cost	Cost
Layer 1:	Beg. inv. (Jan. 1)	200	\$20.00	\$ 4,000
Layer 2:	Jan. 30	600	23.30	13,980
Total		800		\$17,980

When the LIFO method is used, the subsidiary inventory ledger is sometimes maintained in units only. The units are converted to dollars when the financial statements are prepared at the end of the period.

Example Exercise 6-3 Perpetual Inventory Using LIFO



Beginning inventory, purchases, and sales for Item ER27 are as follows:

Nov. 1 Inventory 40 units at \$5
5 Sale 30 units
11 Purchase 70 units at \$7
21 Sale 36 units



Assuming a perpetual inventory system and using the last-in, first-out (LIFO) method, determine (a) the cost of the merchandise sold on November 21 and (b) the inventory on November 30.

Follow My Example 6-3

a. Cost of merchandise sold (November 21): \$252 (36 units × \$7) b. Inventory, November 30:

10 units at \$5 \$ 50 34 units at \$7 238 44 units \$288

Practice Exercises: PE 6-3A, PE 6-3B

International Connection

IFRS INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS)

IFRS permit the first-in, first-out and weighted average cost methods but prohibit the last-in, first-out (LIFO) method for determining inventory costs. Since LIFO is used in the United States, adoption of IFRS could have a

significant impact on many U.S. companies. For example, Caterpillar Inc. uses LIFO. For a recent year, Caterpillar reported that its inventories would have been \$2,750 million higher if FIFO had been used. Since Caterpillar reported profits of \$5,681 million for the year, the adoption of IFRS would have significantly affected net income if IFRS and FIFO had been used.*

*Differences between U.S. GAAP and IFRS are further discussed and illustrated in Appendix C.

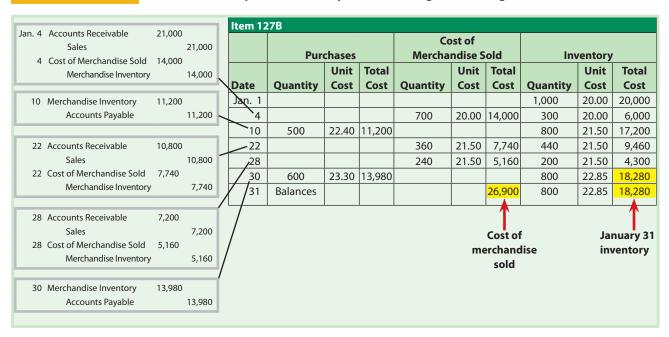
Weighted Average Cost Method

When the weighted average cost method is used in a perpetual inventory system, a weighted average unit cost for each item is computed each time a purchase is made. This unit cost is used to determine the cost of each sale until another purchase is made and a new average is computed. This technique is called a *moving average*.

To illustrate, Exhibit 6 shows the use of weighted average under a perpetual inventory system for Item 127B.

EXHIBIT 6

Entries and Perpetual Inventory Account (Weighted Average)



The journal entries and the subsidiary inventory ledger for Item 127B are shown in Exhibit 6 as follows:

- 1. The beginning balance on January 1 is \$20,000 (1,000 units at a unit cost of \$20).
- 2. On January 4, 700 units were sold at a price of \$30 each for sales of \$21,000 (700 units at a selling price of \$30 per unit). The cost of merchandise sold is \$14,000 (700 units at a unit cost of \$20.00). After the sale, there remains \$6,000 of inventory (300 units at a unit cost of \$20.00).
- 3. On January 10, \$11,200 is purchased (500 units at a unit cost of \$22.40). After the purchase, the weighted average unit cost of \$21.50 is determined by dividing the total

- cost of the inventory on hand of \$17,200 (\$6,000 + \$11,200) by the total quantity of inventory on hand of 800 (300 + 500) units. Thus, after the purchase, the inventory consists of 800 units at \$21.50 per unit for a total cost of \$17,200.
- 4. On January 22, 360 units are sold at a price of \$30 each for sales of \$10,800 (360 units at a selling price of \$30 per unit). Using weighted average, the cost of merchandise sold is \$7,740 (360 units × \$21.50 per unit). After the sale, there remains \$9,460 of inventory (440 units × \$21.50 per unit).
- 5. The January 28 sale and January 30 purchase are recorded in a similar manner.
- 6. The ending balance on January 31 is \$18,280 (800 units × \$22.85 per unit).

Example Exercise 6-4 Perpetual Inventory Using Weighted Average



Beginning inventory, purchases, and sales for ER27 are as follows:

Nov.	1	Inventory	40 units at \$5
	5	Sale	30 units
	11	Purchase	70 units at \$7
	21	Sale	36 units



Assuming a perpetual inventory system using the weighted average method, determine (a) the weighted average unit cost after the November 11 purchase, (b) the cost of the merchandise sold on November 21, and (c) the inventory on November 30.

Follow My Example 6-4

a. Weighted average unit cost: \$6.75
 Inventory total cost after purchase on November 21:

	Cost
10 units at \$5	\$ 50
70 units at \$7	490
80 units	\$540

b. Cost of merchandise sold (November 21): \$243 (36 units × \$6.75)

c. Inventory, November 30: \$297 (44 units at \$6.75)

Weighted average unit cost = \$6.75 ($$540 \div 80$ units)

Practice Exercises: PE 6-4A, PE 6-4B

Computerized Perpetual Inventory Systems

A perpetual inventory system may be used in a manual accounting system. However, if there are many inventory transactions, such a system is costly and time consuming. In almost all cases, perpetual inventory systems are computerized.

Computerized perpetual inventory systems are useful to managers in controlling and managing inventory. For example, fast-selling items can be reordered before the stock runs out. Sales patterns can also be analyzed to determine when to mark down merchandise or when to restock seasonal merchandise. Finally, inventory data can be used in evaluating advertising campaigns and sales promotions.

Determine the cost of inventory under the periodic inventory system, using the FIFO, LIFO, and weighted average cost methods.

Inventory Costing Methods Under a Periodic Inventory System

When the periodic inventory system is used, only revenue is recorded each time a sale is made. No entry is made at the time of the sale to record the cost of the merchandise sold. At the end of the accounting period, a physical inventory is taken to determine the cost of the inventory and the cost of the merchandise sold.²

² Determining the cost of merchandise sold using the periodic system was illustrated in the appendix to Chapter 5.

Like the perpetual inventory system, a cost flow assumption must be made when identical units are acquired at different unit costs during a period. In such cases, the FIFO, LIFO, or weighted average cost method is used.

First-In, First-Out Method

To illustrate the use of the FIFO method in a periodic inventory system, we use the same data for Item 127B as in the perpetual inventory example. The beginning inventory and purchases of Item 127B in January are as follows:

Jan. 1	Inventory	1,000 units at	\$20.00	\$20,000
10	Purchase	500 units at	22.40	11,200
30	Purchase	_600 units at	23.30	_13,980
Available fo	r sale during month	2,100		\$45,180

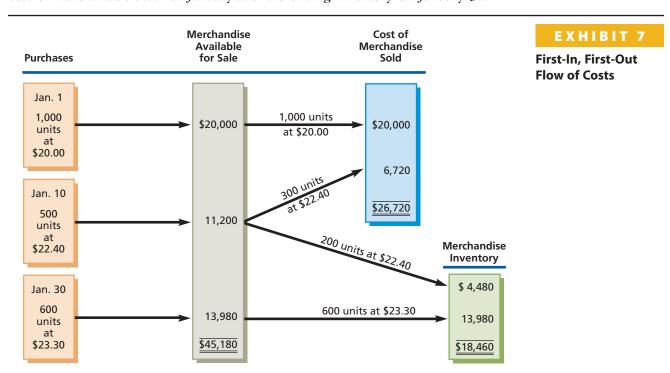
The physical count on January 31 shows that 800 units are on hand. Using the FIFO method, the cost of the merchandise on hand at the end of the period is made up of the most recent costs. The cost of the 800 units in the ending inventory on January 31 is determined as follows:

Most recent costs, January 30 purchase	600 units at	\$23.30	\$13,980
Next most recent costs, January 10 purchase	200 units at	\$22.40	4,480
Inventory, January 31	800 units		\$18,460

Deducting the cost of the January 31 inventory of \$18,460 from the cost of merchandise available for sale of \$45,180 yields the cost of merchandise sold of \$26,720, computed as follows:

Beginning inventory, January 1	\$20,000
Purchases (\$11,200 + \$13,980)	25,180
Cost of merchandise available for sale in January	\$45,180
Less ending inventory, January 31	18,460
Cost of merchandise sold	\$26,720

The \$18,460 cost of the ending merchandise inventory on January 31 is made up of the most recent costs. The \$26,720 cost of merchandise sold is made up of the beginning inventory and the earliest costs. Exhibit 7 shows the relationship of the cost of merchandise sold for January and the ending inventory on January 31.



IFRS See Appendix C for more information.

Last-In, First-Out Method

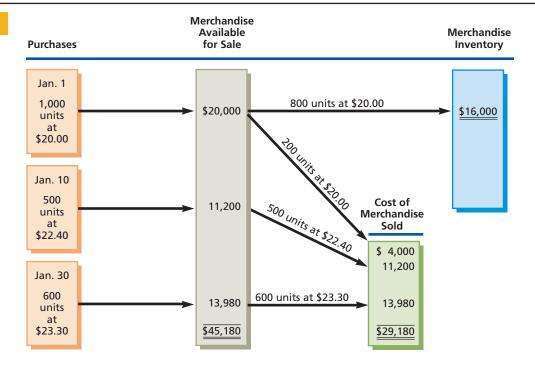
When the LIFO method is used, the cost of merchandise on hand at the end of the period is made up of the earliest costs. Based on the same data as in the FIFO example, the cost of the 800 units in ending inventory on January 31 is \$16,000, which consists of 800 units from the beginning inventory at a cost of \$20.00 per unit.

Deducting the cost of the January 31 inventory of \$16,000 from the cost of merchandise available for sale of \$45,180 yields the cost of merchandise sold of \$29,180, computed as follows:

Beginning inventory, January 1	\$20,000
Purchases (\$11,200 + \$13,980)	25,180
Cost of merchandise available for sale in January	\$45,180
Less ending inventory, January 31	16,000
Cost of merchandise sold	\$29,180

The \$16,000 cost of the ending merchandise inventory on January 31 is made up of the earliest costs. The \$29,180 cost of merchandise sold is made up of the most recent costs. Exhibit 8 shows the relationship of the cost of merchandise sold for January and the ending inventory on January 31.

EXHIBIT 8 Last-In, First-Out Flow of Costs



Weighted Average Cost Method

The weighted average cost method uses the weighted average unit cost for determining the cost of merchandise sold and the ending merchandise inventory. If purchases are relatively uniform during a period, the weighted average cost method provides results that are similar to the physical flow of goods.

The weighted average unit cost is determined as follows:

Weighted Average Unit Cost =
$$\frac{\text{Total Cost of Units Available for Sale}}{\text{Units Available for Sale}}$$

To illustrate, the data for Item 127B is used as follows:

Weighted Average Unit Cost =
$$\frac{\text{Total Cost of Units Available for Sale}}{\text{Units Available for Sale}} = \frac{\$45,180}{2,100 \text{ units}}$$

= \\$21.51 per unit (Rounded)

The cost of the January 31 ending inventory is as follows:

Inventory, January 31: \$17,208 (800 units × \$21.51)

Deducting the cost of the January 31 inventory of \$17,208 from the cost of merchandise available for sale of \$45,180 yields the cost of merchandise sold of \$27,972, computed as follows:

Beginning inventory, January 1	\$20,000
Purchases (\$11,200 + \$13,980)	25,180
Cost of merchandise available for sale in January	\$45,180
Less ending inventory, January 31	17,208
Cost of merchandise sold	\$27,972

Example Exercise 6-5 Periodic Inventory Using FIFO, LIFO, and Weighted Average Cost Methods



The units of an item available for sale during the year were as follows:

Jan. 1	Inventory	6 units at \$50	\$ 300
Mar. 20	Purchase	14 units at \$55	770
Oct. 30	Purchase	20 units at \$62	1,240
Available	for sale	40 units	\$2,310

There are 16 units of the item in the physical inventory at December 31. The periodic inventory system is used. Determine the inventory cost using (a) the first-in, first-out (FIFO) method; (b) the last-in, first-out (LIFO) method; and (c) the weighted average cost method.

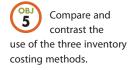
Follow My Example 6-5

- a. First-in, first-out (FIFO) method: $$992 = (16 \text{ units} \times $62)$
- b. Last-in, first-out (LIFO) method: $\$850 = (6 \text{ units} \times \$50) + (10 \text{ units} \times \$55)$
- c. Weighted average cost method: \$924 (16 units \times \$57.75), where average cost = $\$57.75 = \$2,310 \div 40$ units

Practice Exercises: PE 6-5A, PE 6-5B

Comparing Inventory Costing Methods

A different cost flow is assumed for the FIFO, LIFO, and weighted average inventory cost flow methods. As a result, the three methods normally yield different amounts for the following:



- · Cost of merchandise sold
- Gross profit
- Net income
- · Ending merchandise inventory



Using the perpetual inventory system illustration with sales of \$39,000 (1,300 units \times \$30), the following differences are apparent:³

Partial income Statements			
	First-In,	Weighted	Last-In,
	First-Out	Average Cost	First-Out
Sales	\$39,000	\$39,000	\$39,000
Cost of merchandise sold:	26,720	26,900	27,200
Gross profit	¢12.290	\$12,100	¢11 000

The preceding differences show the effect of increasing costs (prices). If costs (prices) remain the same, all three methods would yield the same results. However, costs (prices) normally do change. The effects of changing costs (prices) on the FIFO and LIFO methods are summarized in Exhibit 9. The weighted average cost method will always yield results between those of FIFO and LIFO.

\$18,460

\$18,280

\$17,980

Merchandise Inventory, Jan. 31

EXHIBIT 9

Effects of Changing Costs (Prices): FIFO and LIFO Cost Methods

		+ Increasing Costs — Decreasing Costs (Prices) (Prices)		-
	A Highest Amount	Lowest Amount	A Highest Amount	Lowest Amount
Cost of merchandise sold	LIFO	FIFO	FIFO	LIFO
Gross profit	FIFO	LIFO	LIFO	FIFO
Net income	FIFO	LIFO	LIFO	FIFO
Ending merchandise inventory	FIFO	LIFO	LIFO	FIFO

FIFO reports higher gross profit and net income than the LIFO method when costs (prices) are increasing, as shown in Exhibit 9. However, in periods of rapidly rising costs, the inventory that is sold must be replaced at increasingly higher costs. In such cases, the larger FIFO gross profit and net income are sometimes called *inventory profits* or *illusory profits*.

During a period of increasing costs, LIFO matches more recent costs against sales on the income statement. Thus, it can be argued that the LIFO method more nearly matches current costs with current revenues. LIFO also offers an income tax savings during periods of increasing costs. This is because LIFO reports the lowest amount of gross profit and, thus, taxable net income. However, under LIFO, the ending inventory on the balance sheet may be quite different from its current replacement cost. In such cases, the financial statements normally include a note that estimates what the inventory would have been if FIFO had been used.

The weighted average cost method is, in a sense, a compromise between FIFO and LIFO. The effect of cost (price) trends is averaged in determining the cost of merchandise sold and the ending inventory.

³ Similar results would also occur when comparing inventory costing methods under a periodic inventory system.

⁴ A proposal currently exists to not allow the use of LIFO for tax purposes.

Integrity, Objectivity, and Ethics in Business



WHERE'S THE BONUS?

Managers are often given bonuses based on reported earnings numbers. This can create a conflict. LIFO can improve the value of the company through lower taxes. However, in periods of rising costs (prices), LIFO also produces a lower earnings number and, therefore, lower management

bonuses. Ethically, managers should select accounting procedures that will maximize the value of the firm, rather than their own compensation. Compensation specialists can help avoid this ethical dilemma by adjusting the bonus plan for the accounting procedure differences.

Reporting Merchandise Inventory in the Financial Statements

Describe and illustrate the reporting of merchandise inventory in the financial statements.

Cost is the primary basis for valuing and reporting inventories in the financial statements. However, inventory may be valued at other than cost in the following cases:

- 1. The cost of replacing items in inventory is below the recorded cost.
- 2. The inventory cannot be sold at normal prices due to imperfections, style changes, spoilage, damage, obsolescence, or other causes.

Valuation at Lower of Cost or Market

If the market is lower than the purchase cost, the **lower-of-cost-or-market (LCM) method** is used to value the inventory. *Market*, as used in *lower of cost or market*, is the **net realizable value** of the merchandise.⁵ Net realizable value is determined as follows:



Net Realizable Value = Estimated Selling Price - Direct Costs of Disposal

Direct costs of disposal include selling expenses such as special advertising or sales commissions.

To illustrate, assume the following data about an item of damaged merchandise:

Original cost \$1,000 Estimated selling price 800 Estimated selling expenses 150

In applying LCM, the market value of the merchandise is \$650, computed as follows:

Market Value (Net Realizable Value) = \$800 - \$150 = \$650

Thus, the merchandise would be valued at \$650, which is the lower of its cost of \$1,000 and its market value of \$650.

The lower-of-cost-or-market method can be applied in one of three ways. The cost, market price, and any declines could be determined for the following:

- Each item in the inventory
- Each major class or category of inventory
- Total inventory as a whole

The amount of any price decline is included in the cost of merchandise sold. This, in turn, reduces gross profit and net income in the period in which the price declines occur. This matching of price declines to the period in which they occur is the primary advantage of using the lower-of-cost-or-market method.

⁵ The FASB has issued a Proposed Accounting Standards Update that uses net realizable value as market. Proposed Accounting Standards Update, *Inventory (Topic 3330): Simplifying the Measurement of Inventory*, July 15, 2014, FASB.

To illustrate, assume the following data for 400 identical units of Item A in inventory on December 31, 2016:

Cost per unit \$10.25 Market value (net realizable value) per unit 9.50

Since the market value of Item A is \$9.50 per unit, \$9.50 is used under the lower-of-cost-or-market method.

Exhibit 10 illustrates applying the lower-of-cost-or-market method to each inventory item (Echo, Foxtrot, Sierra, Tango). As applied on an item-by-item basis, the total lower-of-cost-or-market is \$15,070, which is a market decline of \$450 (\$15,520 - \$15,070). This market decline of \$450 is included in the cost of merchandise sold.

In Exhibit 10, Items Echo, Foxtrot, Sierra, and Tango could be viewed as a class of inventory items. If the lower-of-cost-or-market method is applied to the class, the inventory would be valued at \$15,472, which is a market decline of \$48 (\$15,520 - \$15,472). Likewise, if Items Echo, Foxtrot, Sierra, and Tango make up the total inventory, the lower-of-cost-or-market method as applied to the total inventory would be the same amount, \$15,472.

EXHIBIT 10

Determining Inventory at Lower of Cost or Market (LCM)

	Α	В	С	D	Е	F	G
1				Market Value			
2		Inventory	Cost per	per Unit		Total	
3	Item	Quantity	Unit	(Net Realizable Value)	Cost	Market	LCM
4	Echo	400	\$10.25	\$ 9.50	\$ 4,100	\$ 3,800	\$ 3,800
5	Foxtrot	120	22.50	24.10	2,700	2,892	2,700
6	Sierra	600	8.00	7.75	4,800	4,650	4,650
7	Tango	280	14.00	14.75	3,920	4,130	3,920
8	Total				\$15,520	\$15,472	\$15,070

Example Exercise 6-6 Lower-of-Cost-or-Market Method



On the basis of the following data, determine the value of the inventory at the lower of cost or market. Apply lower of cost or market to each inventory item as shown in Exhibit 10.

	Inventory		Market Value per Unit
Item	Quantity	Cost per Unit	(Net Realizable Value)
C17Y	10	\$ 39	\$40
B563	7	110	98

Follow My Example 6-6

	А	В	С	D	Е	F	G
1				Market Value per			
2		Inventory	Cost per	Unit		Total	
3	Item	Quantity	Unit	(Net Realizable Value)	Cost	Market	LCM
4	C17Y	10	\$ 39	\$40	\$ 390	\$ 400	\$ 390
5	B563	7	110	98	770	686	686
6	Total				\$1,160	\$1,086	\$1,076

Practice Exercises: PE 6-6A, PE 6-6B

Business Connection

INVENTORY WRITE-DOWNS

Worthington Industries, Inc., is a diversified metal processing company that manufactures metal products, such as metal framing and pressure cylinders. One year, the company experienced rapidly changing business conditions. Due to the global financial crisis and recession, steel prices underwent a severe and rapid decline. As a result, the company recorded an inventory writedown of \$105 million and an overall net loss of \$108 million for the year.

Merchandise Inventory on the Balance Sheet

Merchandise inventory is usually reported in the Current Assets section of the balance sheet. In addition to this amount, the following are reported:

- The method of determining the cost of the inventory (FIFO, LIFO, or weighted average)
- The method of valuing the inventory (cost or the lower of cost or market)

The financial statement reporting for the topics covered in Chapters 6-13 are illustrated using excerpts from the financial statements of **Mornin' Joe**. Mornin' Joe is a fictitious company that offers drip and espresso coffee in a coffeehouse setting. The complete financial statements of Mornin' Joe are illustrated at the end of Chapter 13.



See Appendix C for

more information.

The balance sheet presentation for merchandise inventory for Mornin' Joe is as follows:

	\$235,000
\$420,000	
45,000	465,000
\$305,000	
12,300	292,700
	120,000
	45,000 \$305,000

It is not unusual for a large business to use different costing methods for segments of its inventories. Also, a business may change its inventory costing method. In such cases, the effect of the change and the reason for the change are disclosed in the financial statements.

Effect of Inventory Errors on the Financial Statements

Any errors in merchandise inventory will affect the balance sheet and income statement. Some reasons that inventory errors may occur include the following:

- Physical inventory on hand was miscounted.
- Costs were incorrectly assigned to inventory. For example, the FIFO, LIFO, or weighted average cost method was incorrectly applied.
- Inventory in transit was incorrectly included or excluded from inventory.
- Consigned inventory was incorrectly included or excluded from inventory.

Inventory errors often arise from merchandise that is in transit at year-end. As discussed in Chapter 5, shipping terms determine when the title to merchandise passes. When goods are purchased or sold FOB shipping point, title passes to the buyer when the goods are shipped. When the terms are FOB destination, title passes to the buyer when the goods are received.

To illustrate, assume that SysExpress ordered the following merchandise from American Products:

Date ordered: December 27, 2015

Amount: \$10,000

Terms: FOB shipping point, 2/10, n/30

Date shipped by seller: December 30
Date delivered: January 3, 2016

When SysExpress counts its physical inventory on December 31, 2015, the merchandise is still in transit. In such cases, it would be easy for SysExpress to not include the \$10,000 of merchandise in its December 31 physical inventory. However, since the merchandise was purchased *FOB shipping point*, SysExpress owns the merchandise. Thus, it should be included in the December 31 inventory, even though it is not on hand. Likewise, any merchandise *sold* by SysExpress *FOB destination* is still SysExpress's inventory, even if it is in transit to the buyer on December 31.

Inventory errors often arise from **consigned inventory**. Manufacturers sometimes ship merchandise to retailers who act as the manufacturer's selling agent. The manufacturer, called the **consignor**, retains title until the goods are sold. Such merchandise is said to be shipped *on consignment* to the retailer, called the **consignee**. Any unsold merchandise at year-end is a part of the manufacturer's (consignor's) inventory, even though the merchandise is in the hands of the retailer (consignee). At year-end, it would be easy for the retailer (consignee) to incorrectly include the consigned merchandise in its physical inventory. Likewise, the manufacturer (consignor) should include consigned inventory in its physical inventory, even though the inventory is not on hand.

Income Statement Effects Inventory errors will misstate the income statement amounts for cost of merchandise sold, gross profit, and net income. The effects of inventory errors on the current period's income statement are summarized in Exhibit 11.

EXHIBIT 11

Effect of Inventory Errors on Current Period's Income Statement

	Income St	Income Statement Effect			
Inventory Error	Cost of Merchandise Sold	Gross Profit	Net Income		
Beginning inventory is:					
Understated √	Understated ▼	Overstated	Overstated		
Overstated	♦ Overstated	Understated ▼	Understated ▼		
Ending inventory is:					
Understated √	♦ Overstated	Understated √	Understated ▼		
♦ Overstated	Understated ▼	Overstated	▲ Overstated		

To illustrate, the income statements of SysExpress shown in Exhibit 12 are used.⁶ On December 31, 2015, assume that SysExpress incorrectly records its physical inventory as \$50,000 instead of the correct amount of \$60,000. Thus, the December 31, 2015, inventory is understated by \$10,000 (\$60,000 – \$50,000). As a result, the cost of merchandise sold is overstated by \$10,000. The gross profit and the net income for the year will also be understated by \$10,000.

The December 31, 2015, merchandise inventory becomes the January 1, 2016, inventory. Thus, the beginning inventory for 2016 is understated by \$10,000. As a result, the cost of merchandise sold is understated by \$10,000 for 2016. The gross profit and net income for 2016 will be overstated by \$10,000.

As shown in Exhibit 12, because the ending inventory of one period is the beginning inventory of the next period, the effects of inventory errors carry forward to the next period. Specifically, if uncorrected, the effects of inventory errors reverse themselves in the next period. In Exhibit 12, the combined net income for the two years of \$525,000 is correct, even though the 2015 and 2016 income statements were incorrect.

⁶ The effect of inventory errors will be illustrated using the periodic system. This is because it is easier to see the impact of inventory errors on the income statement using the periodic system. The effect of inventory errors would be the same under the perpetual inventory system.

EXHIBIT 12 **Effects of Inventory Errors on Two Years' Income Statements SysExpress Income Statement** For the Years Ended December 31, 2015 and 2016 2015 2016 Correct Incorrect Incorrect Sales \$980,000 \$980,000 \$1,100,000 Merchandise inventory, January 1 \$ 55,000 \$ 55,000 ⇒ \$ 50,000 **Purchases** 650,000 650,000 700,000 Merchandise available for sale \$705,000 \$705,000 \$750,000 Less merchandise inventory,

Balance Sheet Effects Inventory errors misstate the merchandise inventory, current assets, total assets, and stockholders' equity on the balance sheet. The effects of

inventory errors on the current period's balance sheet are summarized in Exhibit 13.

Correct \$1,100,000 \$ 60,000 700,000 \$760,000 December 31 60,000 50,000 70,000 70,000 Cost of merchandise sold 645,000 655,000 680,000 690,000 Gross profit \$335,000 \$325,000 420,000 410,000 Operating expenses 100,000 100,000 120,000 120,000 Net income \$235,000 \$225,000 300,000 290,000 \$10,000 \$10,000 Understatement Overstatement of Net Income of Net Income Net Effect Is Zero for Two Years The inventory errors reverse (or cancel) so that the combined net income for the two years of \$525,000 (\$225,000 + \$300,000) is correct.

		Balance	Sheet Effect	
Ending Inventory Error	Merchandise Inventory	Current Assets	Total Assets	Stockholders' Equity (Retained Earnings)
Understated ◆ Overstated	Understated ▼ A Overstated	Understated ↓ ♣ Overstated	Understated ◆ Overstated	Understated ▼ A Overstated

EXHIBIT 13

Effect of Inventory Errors on Current Period's Balance Sheet

For the SysExpress illustration shown in Exhibit 12, the December 31, 2015, ending inventory was understated by \$10,000. As a result, the merchandise inventory, current assets, and total assets would be understated by \$10,000 on the December 31, 2015, balance sheet. Because the ending physical inventory is understated, the cost of merchandise sold for 2015 will be overstated by \$10,000. Thus, the gross profit and the net income for 2015 are understated by \$10,000. Because the net income is closed to Retained Earnings at the end of the period, the stockholders' equity on the December 31, 2015, balance sheet is also understated by \$10,000.

Inventory errors reverse themselves within two years. As a result, the balance sheet will be correct as of December 31, 2016. Using the SysExpress illustration from Exhibit 12, these effects are summarized as follows:

	Allibuilt of N	lisstatellielit
Balance Sheet:	December 31, 2015	December 31, 2016
Merchandise inventory overstated (understated)	\$(10,000)	Correct
Current assets overstated (understated)	(10,000)	Correct
Total assets overstated (understated)	(10,000)	Correct
Stockholders' equity overstated (understated)	(10,000)	Correct
Income Statement:	2015	2016
Cost of merchandise sold overstated (understated)	\$ 10,000	\$(10,000)
Gross profit overstated (understated)	(10,000)	10,000
Net income overstated (understated)	(10,000)	10,000

Example Exercise 6-7 Effect of Inventory Errors



Amount of Misstatement

Practice Exercises: PE 6-7A, PE 6-7B

Zula Repair Shop incorrectly counted its December 31, 2016, inventory as \$250,000 instead of the correct amount of \$220,000. Indicate the effect of the misstatement on Zula's December 31, 2016, balance sheet and income statement for the year ended December 31, 2016.

Follow My Example 6-7

	Amount of Misstatement
	Overstatement (Understatement)
Balance Sheet:	
Merchandise inventory overstated	\$ 30,000
Current assets overstated	30,000
Total assets overstated	30,000
Stockholders' equity overstated	30,000
Income Statement:	
Cost of merchandise sold understated	\$(30,000)
Gross profit overstated	30,000
Net income overstated	30,000

Describe and illustrate the inventory turnover and the number of days' sales in inventory in analyzing the efficiency and effectiveness of inventory management.



Financial Analysis and Interpretation: Inventory Turnover and Number of Days' Sales in Inventory

A merchandising business should keep enough inventory on hand to meet its customers' needs. A failure to do so may result in lost sales. However, too much inventory ties up funds that could be used to improve operations. Also, excess inventory increases expenses such as storage and property taxes. Finally, excess inventory increases the risk of losses due to price declines, damage, or changes in customer tastes.

Two measures to analyze the efficiency and effectiveness of inventory management are:

- inventory turnover and
- number of days' sales in inventory.

Inventory turnover measures the relationship between the cost of merchandise sold and the amount of inventory carried during the period. It is computed as follows:

 $Inventory Turnover = \frac{Cost of Merchandise Sold}{Average Inventory}$



Business Connection

RAPID INVENTORY AT COSTCO

Costco Wholesale Corporation operates more than 500 membership warehouses that offer members low prices on a limited selection of nationally branded and selected private label products. Costco emphasizes high sales volumes and rapid inventory turnover. This enables Costco to operate profitably at lower gross margins than traditional wholesalers, discount retailers, and supermarkets. In addition, Costco's rapid inventory turnover allows it to conserve its working capital, described as follows:

Because of our high sales volume and rapid inventory turnover, we generally have the opportunity to sell and be paid for inventory before we are required to pay . . . our merchandise vendors As sales increase and inventory turnover becomes more rapid, a greater percentage of inventory is financed through payment terms provided by suppliers rather than by our working capital.

Source: Costco Wholesale Corporation, Form 10-K For the Fiscal Year Ended September 1, 2013.

To illustrate, inventory turnover for Best Buy is computed from the following data (in millions) taken from two recent annual reports:

For the Year Ended	
Year 2	Year 1
\$38,132	\$37,206
5,897	5,486
5,731	5,897
5,814.0	
	5,691.5
6.6	
	6.5
	Year 2 \$38,132 5,897 5,731 5,814.0

^{*} Rounded to one decimal place.

Generally, the larger the inventory turnover the more efficient and effective the company is in managing inventory. In the preceding example, inventory turnover increased slightly from 6.5 to 6.6 during Year 2, and thus Best Buy's inventory efficiency increased during Year 2.

The number of days' sales in inventory measures the length of time it takes to acquire, sell, and replace the inventory. It is computed as follows:

$$Number of Days' Sales in Inventory = \frac{Average Inventory}{Average Daily Cost of Merchandise Sold}$$

The average daily cost of merchandise sold is determined by dividing the cost of merchandise sold by 365.7 Based upon the preceding data, the number of days' sales in inventory for Best Buy is computed as follows:

	For the Year Ended	
	Year 2	Year 1
Cost of merchandise sold	\$38,132	\$37,206
Average daily cost of merchandise sold:*		
\$38,132 ÷ 365 days	104.5	
\$37,206 ÷ 365 days		101.9
Average inventory:*		
(\$5,897 + \$5,731) ÷ 2	5,814.0	
(\$5,486 + \$5,897) ÷ 2		5,691.5
Number of days' sales in inventory:*		
\$5,814.0 ÷ \$104.5	55.6 days	
\$5,691.5 ÷ \$101.9		55.9 days

^{*} Rounded to one decimal place.

⁷ We use 365 days for all computations involving real world companies and data. We do this to highlight differences among companies and because computations using real world data normally require rounding.

Generally, the lower the number of days' sales in inventory, the more efficient and effective the company is in managing inventory. As shown previously, the number of days' sales in inventory decreased slightly from 55.9 to 55.6 during Year 2, and thus Best Buy's inventory management improved. This is consistent with the increase in inventory turnover during the year.

As with most financial ratios, differences exist among industries. To illustrate, **Zale Corporation** is a large retailer of fine jewelry in the United States. Because jewelry doesn't sell as rapidly as Best Buy's consumer electronics, Zale's inventory turnover and number of days' sales in inventory should be significantly different than Best Buy's. For a recent year, this is confirmed as follows:

	Best Buy	Zale
Inventory turnover	6.6	1.2
Number of days' sales in inventory	55.6 days	294.7 days

Example Exercise 6-8 Inventory Turnover and Number of Days' Sales in Inventory



Financial statement data for years ending December 31 for Beadle Company follows:

	2016	2015
Cost of merchandise sold	\$877,500	\$615,000
Inventories:		
Beginning of year	225,000	185,000
End of year	315,000	225,000

- a. Determine the inventory turnover for 2016 and 2015.
- b. Determine the number of days' sales in inventory for 2016 and 2015, using 365 days.
- c. Does the change in the inventory turnover and the number of days' sales in inventory from 2015 to 2016 indicate a favorable or an unfavorable trend?

2015

2016

Follow My Example 6-8

a. Inventory turnover:

Average inventory:

\$205,000 ÷ \$1,685

	Average inventory:		
	(\$225,000 + \$315,000) ÷ 2	\$270,000	
	(\$185,000 + \$225,000) ÷ 2		\$205,000
	Inventory turnover:		
	\$877,500 ÷ \$270,000	3.25	
	\$615,000 ÷ \$205,000		3.00
b.	Number of days' sales in inventory:		
	Average daily cost of merchandise sold:		
	\$877,500 ÷ 365 days	\$2,404	
	\$615,000 ÷ 365 days		\$1,685
	Average inventory:		
	(\$225,000 + \$315,000) ÷ 2	\$270,000	
	(\$185,000 + \$225,000) ÷ 2		\$205,000
	Number of days' sales in inventory:		
	\$270,000 ÷ \$2,404	112.3 days	
		•	

c. The increase in the inventory turnover from 3.00 to 3.25 and the decrease in the number of days' sales in inventory from 121.7 days to 112.3 days indicate favorable trends in managing inventory.

121.7 days

Practice Exercises: PE 6-8A, PE 6-8B

A P P E N D I X

Estimating Inventory Cost

A business may need to estimate the amount of inventory for the following reasons:

- Perpetual inventory records are not maintained.
- A disaster such as a fire or flood has destroyed the inventory records and the inventory.
- Monthly or quarterly financial statements are needed, but a physical inventory is taken only once a year.

This appendix describes and illustrates two widely used methods of estimating inventory cost.

Retail Method of Inventory Costing

The **retail inventory method** of estimating inventory cost requires costs and retail prices to be maintained for the merchandise available for sale. A ratio of cost to retail price is then used to convert ending inventory at retail to estimate the ending inventory cost.

The retail inventory method is applied as follows:

- Step 1. Determine the total merchandise available for sale at cost and retail.
- Step 2. Determine the ratio of the cost to retail of the merchandise available for sale.
- Step 3. Determine the ending inventory at retail by deducting the sales from the merchandise available for sale at retail.
- Step 4. Estimate the ending inventory cost by multiplying the ending inventory at retail
 by the cost to retail ratio.

Exhibit 14 illustrates the retail inventory method.

		А	В	С
	1		Cost	Retail
	2	Merchandise inventory, January 1	\$19,400	\$ 36,000
	3	Purchases in January (net)	42,600	64,000
Step 1 —	- 4	Merchandise available for sale	\$62,000	\$100,000
Step 2 →	- 5	Ratio of cost to retail price: $\frac{\$62,000}{\$100,000} = \frac{62\%}{100,000}$		
	6	Sales for January		70,000
		Merchandise inventory, January 31, at retail		\$ 30,000
Step 4 —	8	Merchandise inventory, January 31, at estimated cost		
	9	$($30,000 \times 62\%)$		\$ 18,600

EXHIBIT 14

Determining Inventory by the Retail Method

When estimating the cost to retail ratio, the mix of items in the ending inventory is assumed to be the same as the merchandise available for sale. If the ending inventory is made up of different classes of merchandise, cost to retail ratios may be developed for each class of inventory.

An advantage of the retail method is that it provides inventory figures for preparing monthly statements. Department stores and similar retailers often determine gross profit and operating income each month but may take a physical inventory only once or twice a year. Thus, the retail method allows management to monitor operations more closely.

The retail method may also be used as an aid in taking a physical inventory. In this case, the items are counted and recorded at their retail (selling) prices instead of their costs. The physical inventory at retail is then converted to cost by using the cost to retail ratio.

Gross Profit Method of Inventory Costing

The **gross profit method** uses the estimated gross profit for the period to estimate the inventory at the end of the period. The gross profit is estimated from the preceding year, adjusted for any current-period changes in the cost and sales prices. The gross profit method is applied as follows:

- Step 1. Determine the merchandise available for sale at cost.
- Step 2. Determine the estimated gross profit by multiplying the sales by the gross profit percentage.
- Step 3. Determine the estimated cost of merchandise sold by deducting the estimated gross profit from the sales.
- Step 4. Estimate the ending inventory cost by deducting the estimated cost of merchandise sold from the merchandise available for sale.

Exhibit 15 illustrates the gross profit method.

EXHIBIT 15

Estimating Inventory by Gross Profit Method

		A	В	С
	1			Cost
	2	Merchandise inventory, January 1		\$ 57,000
	3	Purchases in January (net)		180,000
Step 1 ——▶	- 4	Merchandise available for sale		\$237,000
	5	Sales for January	\$250,000	
Step 2 ——▶		Less estimated gross profit ($$250,000 \times 30\%$)	75,000	
Step 3	- 7	Estimated cost of merchandise sold		175,000
Step 4 ──►	- 8	Estimated merchandise inventory, January 31		\$ 62,000

The gross profit method is useful for estimating inventories for monthly or quarterly financial statements. It is also useful in estimating the cost of merchandise destroyed by fire or other disasters.

At a Glance 6



<u>Describe the</u> importance of control over inventory.

Key Points Two objectives of inventory control are safeguarding the inventory and properly reporting it in the financial statements. The perpetual inventory system and physical count enhance control over inventory.

Learning Outcomes Describe controls for safeguarding inventory. Describe how a perpetual inventory system enhances control over inventory. Describe why taking a physical inventory enhances control over inventory.



Describe three inventory cost flow assumptions and how they impact the income statement and balance sheet.

Key Points The three common inventory cost flow assumptions used in business are the (1) first-in, first-out method (FIFO); (2) last-in, first-out method (LIFO); and (3) weighted average cost method. The cost flow assumption affects the income statement and balance sheet.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe the FIFO, LIFO, and weighted average cost flow methods.		
• Describe how the choice of a cost flow method affects the income statement and balance sheet.	EE6-1	PE6-1A, 6-1B



Determine the cost of inventory under the perpetual inventory system, using the FIFO, LIFO, and weighted average cost methods.

Key Points In a perpetual inventory system, the number of units and the cost of each type of merchandise are recorded in a subsidiary inventory ledger, with a separate account for each type of merchandise.

Learning Outcomes	Example Exercises	Practice Exercises
• Determine the cost of inventory and the cost of merchandise sold, using a perpetual inventory system under the FIFO method.	EE6-2	PE6-2A, 6-2B
• Determine the cost of inventory and the cost of merchandise sold, using a perpetual inventory system under the LIFO method.	EE6-3	PE6-3A, 6-3B
• Determine the cost of inventory and the cost of merchandise sold, using a perpetual inventory system under the weighted average cost method.	EE6-4	PE6-4A, 6-4B



Determine the cost of inventory under the periodic inventory system, using the FIFO, LIFO, and weighted average cost methods.

Key Points In a periodic inventory system, a physical inventory is taken to determine the cost of the inventory and the cost of merchandise sold.

Learning Outcomes	Example Exercises	Practice Exercises
 Determine the cost of inventory and the cost of merchandise sold, using a periodic inventory system under the FIFO method. 	EE6-5	PE6-5A, 6-5B
• Determine the cost of inventory and the cost of merchandise sold, using a periodic inventory system under the LIFO method.	EE6-5	PE6-5A, 6-5B
• Determine the cost of inventory and the cost of merchandise sold, using a periodic inventory system under the weighted average cost method.	EE6-5	PE6-5A, 6-5B



Compare and contrast the use of the three inventory costing methods.

Key Points The three inventory costing methods will normally yield different amounts for (1) the ending inventory, (2) the cost of merchandise sold for the period, and (3) the gross profit (and net income) for the period.

Learning Outcomes	Example Exercises	Practice Exercises
 Indicate which inventory cost flow method will yield the highest and lowest ending inventory and net income during periods of increasing prices. 		
 Indicate which inventory cost flow method will yield the highest and lowest ending inventory and net income during periods of decreasing prices. 		



Describe and illustrate the reporting of merchandise inventory in the financial statements.

Key Points The lower of cost or market is used to value inventory. The market value is the net realizable value of the merchandise.

Merchandise inventory is usually presented in the Current Assets section of the balance sheet, following receivables. The method of determining the cost and valuing the inventory is reported.

Errors in reporting inventory based on the physical inventory will affect the balance sheet and income statement.

Learning Outcomes • Determine inventory using lower of cost or market.	Example Exercises EE6-6	Practice Exercises PE6-6A, 6-6B
• Prepare the Current Assets section of the balance sheet that includes inventory.		
• Determine the effect of inventory errors on the balance sheet and income statement.	EE6-7	PE6-7A, 6-7B



Describe and illustrate the inventory turnover and the number of days' sales in inventory in analyzing the efficiency and effectiveness of inventory management.

Key Points Two measures to analyze the efficiency and effectiveness of inventory management are (1) inventory turnover and (2) number of days' sales in inventory

Learning Outcomes	Example Exercises	Practice Exercises
 Describe the use of inventory turnover and number of days' sales in inventory in analyzing how well a company manages inventory. 		
Compute the inventory turnover.	EE6-8	PE6-8A, 6-8B
• Compute the number of days' sales in inventory.	EE6-8	PE6-8A, 6-8B

Key Terms

consigned inventory (288) consignee (288) consignor (288) first-in, first-out (FIFO) inventory cost flow method (274) gross profit method (294) inventory turnover (290) last-in, first-out (LIFO) inventory cost flow method (274) lower-of-cost-or-market (LCM) method (285) net realizable value (285) number of days' sales in inventory (291) physical inventory (273) purchase order (272)
receiving report (272)
retail inventory method (293)
specific identification inventory
cost flow method (274)
subsidiary inventory ledger (273)
weighted average inventory
cost flow method (274)

Illustrative Problem

Stewart Co.'s beginning inventory and purchases during the year ended December 31, 2016, were as follows:

		Unit	Units Cost	Total Cost
January 1	Inventory	1,000	\$50.00	\$ 50,000
March 10	Purchase	3,000	52.00	156,000
June 25	Sold 1,600 units			
August 30	Purchase	2,600	55.00	143,000
October 5	Sold 4,000 units			
November 26	Purchase	1,000	57.68	57,680
December 31	Sold 800 units			
Total		7,600		\$406,680
November 26 December 31	Purchase	$\frac{1,000}{7,600}$	57.68	57,680 \$406,680

Instructions

- 1. Determine the cost of inventory on December 31, 2016, using the perpetual inventory system and each of the following inventory costing methods:
 - a. first-in, first-out
 - b. last-in, first-out
 - c. weighted average
- 2. Determine the cost of inventory on December 31, 2016, using the periodic inventory system and each of the following inventory costing methods:
 - a. first-in, first-out
 - b. last-in, first-out
 - c. weighted average cost
- 3. (Appendix) Assume that during the fiscal year ended December 31, 2016, sales were \$530,000 and the estimated gross profit rate was 36%. Estimate the ending inventory at December 31, 2016, using the gross profit method.

Solution

- 1. The perpetual inventory ledgers follow:
 - a. First-in, first-out method: \$68,680 (\$11,000 + \$57,680)
 - b. Last-in, first-out method: \$61,536 (\$50,000 + \$11,536)
 - c. Weighted average cost method: $$66,600 (1,200 \text{ units} \times $55.50)$
- 2. a. First-in, first-out method:

1,000 units at \$57.68 \$57,680 200 units at \$55.00 11,000 1,200 units \$55.00

b. Last-in, first-out method:

1,000 units at \$50.00 \$50,000 200 units at \$52.00 1,200 units \$52.00

c. Weighted average cost method:

Weighted average cost per unit: ($$406,680 \div 7,600 \text{ units} = 53.51 (Rounded) Inventory, December 31, 2016: 1,200 units at \$53.51 = \$64,212

1. a. First-in, first-out method: \$68,680 (\$11,000 + \$57,680)

	Purchases		Cost of Merchandise Sold		Inventory				
Date	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
2016									
Jan. 1							1,000	50.00	50,000
Mar. 10	3,000	52.00	156,000				1,000	50.00	50,000
							3,000	52.00	156,000
June 25				1,000	50.00	50,000	2,400	52.00	124,800
				600	52.00	31,200			
Aug. 30	2,600	55.00	143,000				2,400	52.00	124,800
							2,600	55.00	143,000
Oct. 5				2,400	52.00	124,800	1,000	55.00	55,000
				1,600	55.00	88,000			
Nov. 26	1,000	57.68	57,680				1,000	55.00	55,000
							1,000	57.68	57,680
Dec. 31				800	55.00	44,000	200	55.00	11,000
							1,000	57.68	57,680
31	Balances					338,000			68,680

b. Last-in, first-out method: \$61,536 (\$50,000 + \$11,536)

		Purchases		Cost of Merchandise Sold		old		Inventory	
Date	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
2016									
Jan. 1							1,000	50.00	50,000
Mar. 10	3,000	52.00	156,000				1,000	50.00	50,000
							3,000	52.00	156,000
June 25				1,600	52.00	83,200	1,000	50.00	50,000
							1,400	52.00	72,800
Aug. 30	2,600	55.00	143,000				1,000	50.00	50,000
							1,400	52.00	72,800
							2,600	55.00	143,000
Oct. 5				2,600	55.00	143,000	1,000	50.00	50,000
				1,400	52.00	72,800			
Nov. 26	1,000	57.68	57,680				1,000	50.00	50,000
							1,000	57.68	57,680
Dec. 31				800	57.68	46,144	1,000	50.00	50,000
							200	57.68	11,536
31	Balances					345,144			61,536

c. Weighted average cost method: $$66,600 (1,200 \text{ units} \times $55.50)$

	Purchases			Cost of Merchandise Sold		old		Inventory	
Date	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Jan. 1							1,000	50.00	50,000
Mar. 10	3,000	52.00	156,000				4,000	51.50	206,000
June 25				1,600	51.50	82,400	2,400	51.50	123,600
Aug. 30	2,600	55.00	143,000				5,000	53.32	266,600
Oct. 5				4,000	53.32	213,280	1,000	53.32	53,320
Nov. 26	1,000	57.68	57,680				2,000	55.50	111,000
Dec. 31				800	55.50	44,400	1,200	55.50	66,600
31	Balances					340,080	1,200	55.50	66,600

3. (Appendix)

Merchandise inventory, January 1, 2016		\$ 50,000
Purchases (net)		356,680
Merchandise available for sale		\$406,680
Sales	\$530,000	
Less estimated gross profit (\$530,000 $ imes$ 36%)	190,800	
Estimated cost of merchandise sold		339,200
Estimated merchandise inventory, December 31, 2016		\$ 67,480

Discussion Questions

- Before inventory purchases are recorded, the receiving report should be reconciled to what documents?
- 2. Why is it important to periodically take a physical inventory when using a perpetual inventory system?
- Do the terms FIFO, LIFO, and weighted average refer to techniques used in determining quantities of the various classes of merchandise on hand? Explain.
- 4. If merchandise inventory is being valued at cost and the price level is decreasing, which of the three methods of costing—FIFO, LIFO, or weighted average cost—will yield (a) the highest inventory cost, (b) the lowest inventory cost, (c) the highest gross profit, and (d) the lowest gross profit?
- 5. Which of the three methods of inventory costing—FIFO, LIFO, or weighted average cost—will in general yield an inventory cost most nearly approximating current replacement cost?
- 6. If inventory is being valued at cost and the price level is steadily rising, which of the three methods of costing—FIFO, LIFO, or weighted average cost—will yield the lowest annual income tax expense? Explain.

7. Using the following data, how should the merchandise be valued under lower of cost or market?

Original cost	\$1,350
Estimated selling price	1,475
Selling expenses	180

- 8. The inventory at the end of the year was understated by \$14,750. (a) Did the error cause an overstatement or an understatement of the gross profit for the year? (b) Which items on the balance sheet at the end of the year were overstated or understated as a result of the error?
- Hutch Co. sold merchandise to Bibbins Company on May 31, FOB shipping point. If the merchandise is in transit on May 31, the end of the fiscal year, which company would report it in its financial statements? Explain.
- 10. A manufacturer shipped merchandise to a retailer on a consignment basis. If the merchandise is unsold at the end of the period, in whose inventory should the merchandise be included?

Practice Exercises

EE 6-1 p. 275

PE 6-1A Cost flow methods

OBJ. 2

The following three identical units of Item BZ1810 are purchased during November:



		Item BZ1810	Units	Cost	
Nov.	2	Purchase	1	\$ 55	
	14	Purchase	1	57	
	28	Purchase	<u>1</u>	62	
	Total		3	\$174	
	Average	cost per unit	=	\$ 58 (\$174 ÷ 3 u	nits)

Assume that one unit is sold on November 30 for \$90.

Determine the gross profit for November and ending inventory on November 30 using the (a) first-in, first-out (FIFO); (b) last-in, first-out (LIFO); and (c) weighted average cost methods.

EE 6-1 p. 275

PE 6-1B Cost flow methods

OBJ. 2



The following three identical units of Item Beta are purchased during June:

		Item Beta	Units	Cost
June	2	Purchase	1	\$ 50
	12	Purchase	1	60
	23	Purchase	<u>1</u>	70
	Total		3	\$180
	Average	cost per unit	=	\$ 60

Assume that one unit is sold on June 27 for \$110.

Determine the gross profit for June and ending inventory on June 30 using the (a) first-in, first-out (FIFO); (b) last-in, first-out (LIFO); and (c) weighted average cost methods.

EE 6-2 p. 277

PE 6-2A Perpetual inventory using FIFO

OBJ. 3



Beginning inventory, purchases, and sales for Item ProX2 are as follows:

Jan. 1	Inventory	60 units at \$100
9	Sale	35 units
13	Purchase	50 units at \$110
25	Sale	48 units

Assuming a perpetual inventory system and using the first-in, first-out (FIFO) method, determine (a) the cost of merchandise sold on January 25 and (b) the inventory on January 31.

EE 6-2 *p. 277*

PE 6-2B Perpetual inventory using FIFO

OBJ. 3

Beginning inventory, purchases, and sales for Item Delta are as follows:

July 1	Inventory	50 units at \$15
7	Sale	44 units
15	Purchase	90 units at \$18
24	Sale	40 units

Assuming a perpetual inventory system and using the first-in, first-out (FIFO) method, determine (a) the cost of merchandise sold on July 24 and (b) the inventory on July 31.

EE 6-3 p. 278

PE 6-3A Perpetual inventory using LIFO

OBJ. 3



MF HOW

Beginning inventory, purchases, and sales for Item Zebra 9x are as follows:

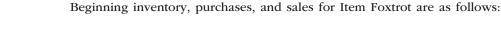
April 1	Inventory	420 units at \$8
10	Sale	300 units
18	Purchase	280 units at \$9
27	Sale	250 units

Assuming a perpetual inventory system and using the last-in, first-out (LIFO) method, determine (a) the cost of merchandise sold on April 27 and (b) the inventory on April 30.

EE 6-3 p. 278

PE 6-3B Perpetual inventory using LIFO

OBJ. 3



• / •	,			
Mar.	1	Inventory	270 units at \$18	

Mar. 1	Inventory	270 units at \$18
8	Sale	225 units
15	Purchase	375 units at \$20
27	Sale	240 units

Assuming a perpetual inventory system and using the last-in, first-out (LIFO) method, determine (a) the cost of merchandise sold on March 27 and (b) the inventory on March 31.



EE 6-4 p. 280 PE 6-4A Perpetual inventory using weighted average

OBJ. 3



ME HOW

Beginning inventory, purchases, and sales for 30xT are as follows:

May 1	Inventory	50 units at \$80
12	Sale	35 units
23	Purchase	60 units at \$90
26	Sale	55 units

Assuming a perpetual inventory system and using the weighted average method, determine (a) the weighted average unit cost after the May 23 purchase, (b) the cost of the merchandise sold on May 26, and (c) the inventory on May 31.

EE 6-4 p. 280 PE 6-4B Perpetual inventory using weighted average

OBJ. 3

Beginning inventory, purchases, and sales for WCS12 are as follows:

Oct. 1	Inventory	300 units at \$8
13	Sale	175 units
22	Purchase	375 units at \$10
29	Sale	280 units

Assuming a perpetual inventory system and using the weighted average method, determine (a) the weighted average unit cost after the October 22 purchase, (b) the cost of the merchandise sold on October 29, and (c) the inventory on October 31.

EE 6-5 *p. 283*

PE 6-5A Periodic inventory using FIFO, LIFO, and weighted average cost methods OBJ. 4

The units of an item available for sale during the year were as follows:

Jan.	1	Inventory	12 units at \$5,400	\$ 64,800
Aug.	7	Purchase	18 units at \$6,000	108,000
Dec.	11	Purchase	15 units at \$6,480	97,200
	Available fo	r sale	45 units	\$270,000

There are 14 units of the item in the physical inventory at December 31. The periodic inventory system is used. Determine the inventory cost using (a) the first-in, first-out (FIFO) method; (b) the last-in, first-out (LIFO) method; and (c) the weighted average cost method.

FF 6-5 n 283

PE 6-5B Periodic inventory using FIFO, LIFO, and weighted average cost methods OBJ. 4

The units of an item available for sale during the year were as follows:

Jan.	1	Inventory	20 units at \$360	ċ	7,200
Jan.	1	inventory	20 units at \$300	ڔ	7,200
Aug.	13	Purchase	260 units at \$342		88,920
Nov.	30	Purchase	40 units at \$357		14,280
	Available fo	r sale	320 units	\$1	10,400

There are 57 units of the item in the physical inventory at December 31. The periodic inventory system is used. Determine the inventory cost using (a) the first-in, first-out (FIFO) method; (b) the last-in, first-out (LIFO) method; and (c) the weighted average cost method.

EE 6-6 p. 286

PE 6-6A Lower-of-cost-or-market method

OBJ. 6

On the basis of the following data, determine the value of the inventory at the lower of cost or market. Apply lower of cost or market to each inventory item, as shown in Exhibit 10.

Item	Inventory Quantity	Cost per Unit	Market Value per Unit (Net Realizable Value)
Raven 10	1,200	\$115	\$112
Dove 23	6,500	17	22



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EE 6-6 p. 286

PE 6-6B Lower-of-cost-or-market method

OBJ. 6

SHOW ME HOW On the basis of the following data, determine the value of the inventory at the lower of cost or market. Apply lower of cost or market to each inventory item, as shown in Exhibit 10.

Item	Inventory Cotem Quantity		Market Value per Unit (Net Realizable Value)
JFW1	6,330	\$10	\$11
SAW9	1,140	36	34

EE 6-7 n 290

PE 6-7A Effect of inventory errors

OBJ. 6



During the taking of its physical inventory on August 31, 2016, Kate Interiors Company incorrectly counted its inventory as \$366,900 instead of the correct amount of \$378,500. Indicate the effect of the misstatement on Kate Interiors' August 31, 2016, balance sheet and income statement for the year ended August 31, 2016.

EE 6-7 p. 290

PE 6-7B Effect of inventory errors

OBJ. 6



ME HOW

During the taking of its physical inventory on December 31, 2016, Waterjet Bath Company incorrectly counted its inventory as \$728,660 instead of the correct amount of \$719,880. Indicate the effect of the misstatement on Waterjet Bath's December 31, 2016, balance sheet and income statement for the year ended December 31, 2016.

EE 6-8 *p. 292*

PE 6-8A Inventory turnover and number of days' sales in inventory

OBJ. 7



Financial statement data for years ending December 31 for Holland Company follows:

	2016	2015
Cost of merchandise sold	\$4,504,500	\$3,715,200
Inventories:		
Beginning of year	788,000	760,000
End of year	850,000	788,000

- a. Determine the inventory turnover for 2016 and 2015.
- b. Determine the number of days' sales in inventory for 2016 and 2015. Use 365 days and round to one decimal place.
- c. Does the change in inventory turnover and the number of days' sales in inventory from 2015 to 2016 indicate a favorable or an unfavorable trend?

EE 6-8 p. 292

PE 6-8B Inventory turnover and number of days' sales in inventory

OBJ. 7





Financial statement data for years ending December 31 for Tango Company follows:

	2016	2015
Cost of merchandise sold	\$3,864,000	\$4,001,500
Inventories:		
Beginning of year	770,000	740,000
End of year	840,000	770,000

- a. Determine the inventory turnover for 2016 and 2015.
- b. Determine the number of days' sales in inventory for 2016 and 2015. Use 365 days and round to one decimal place.
- c. Does the change in inventory turnover and the number of days' sales in inventory from 2015 to 2016 indicate a favorable or an unfavorable trend?

Exercises

EX 6-1 Control of inventories

OBJ. 1

Triple Creek Hardware Store currently uses a periodic inventory system. Kevin Carlton, the owner and sole stockholder, is considering the purchase of a computer system that would make it feasible to switch to a perpetual inventory system.

Kevin is unhappy with the periodic inventory system because it does not provide timely information on inventory levels. Kevin has noticed on several occasions that the store runs out of good-selling items, while too many poor-selling items are on hand.

Kevin is also concerned about lost sales while a physical inventory is being taken. Triple Creek Hardware currently takes a physical inventory twice a year. To minimize distractions, the store is closed on the day inventory is taken. Kevin believes that closing the store is the only way to get an accurate inventory count.

Will switching to a perpetual inventory system strengthen Triple Creek Hardware's control over inventory items? Will switching to a perpetual inventory system eliminate the need for a physical inventory count? Explain.

EX 6-2 Control of inventories

OBJ. 1

Hardcase Luggage Shop is a small retail establishment located in a large shopping mall. This shop has implemented the following procedures regarding inventory items:

- a. Because the shop carries mostly high-quality, designer luggage, all inventory items are tagged with a control device that activates an alarm if a tagged item is removed from the store.
- b. Because the display area of the store is limited, only a sample of each piece of luggage is kept on the selling floor. Whenever a customer selects a piece of luggage, the salesclerk gets the appropriate piece from the store's stockroom. Because all salesclerks need access to the stockroom, it is not locked. The stockroom is adjacent to the break room used by all mall employees.
- c. Whenever Hardcase Luggage Shop receives a shipment of new inventory, the items are taken directly to the stockroom. Hardcase's accountant uses the vendor's invoice to record the amount of inventory received.

State whether each of these procedures is appropriate or inappropriate. If it is inappropriate, state why.

EX 6-3 Perpetual inventory using FIFO

OBJ. 2, 3

Beginning inventory, purchases, and sales data for portable DVD players are as follows:

June	1	Inventory	240 units at \$78
	10	Sale	180 units
	15	Purchase	280 units at \$80
	20	Sale	220 units
	24	Sale	90 units
	30	Purchase	320 units at \$86

The business maintains a perpetual inventory system, costing by the first-in, first-out method.

- a. Determine the cost of the merchandise sold for each sale and the inventory balance after each sale, presenting the data in the form illustrated in Exhibit 4.
- b. Based upon the preceding data, would you expect the inventory to be higher or lower using the last-in, first-out method?

✓ Inventory balance, June 30, \$29,860

✓ Inventory balance,

June 30, \$29,920





EX 6-4 Perpetual inventory using LIFO

OBJ. 2, 3

Assume that the business in Exercise 6-3 maintains a perpetual inventory system, costing by the last-in, first-out method. Determine the cost of merchandise sold for each sale and the inventory balance after each sale, presenting the data in the form illustrated in Exhibit 5.

✓ Inventory balance, May 31, \$20,160





✓ Inventory balance, May 31, \$21,120





√ b. \$22,000



✓ Total Cost of Merchandise Sold, \$1,758,750



✓ Total Cost of Merchandise Sold, \$154,400

EX 6-5 Perpetual inventory using LIFO

OBJ. 2, 3

Beginning inventory, purchases, and sales data for prepaid cell phones for May are as follows:

Inventory		Purchases		Sales	
May 1	1,550 units at \$44	May 10	720 units at \$45	May 12	1,200 units
		20	1,200 units at \$48	14	830 units
				31	1.000 units

- a. Assuming that the perpetual inventory system is used, costing by the LIFO method, determine the cost of merchandise sold for each sale and the inventory balance after each sale, presenting the data in the form illustrated in Exhibit 5.
- b. Based upon the preceding data, would you expect the inventory to be higher or lower using the first-in, first-out method?

EX 6-6 Perpetual inventory using FIFO

OBJ. 2, 3

Assume that the business in Exercise 6-5 maintains a perpetual inventory system, costing by the first-in, first-out method. Determine the cost of merchandise sold for each sale and the inventory balance after each sale, presenting the data in the form illustrated in Exhibit 4.

EX 6-7 FIFO and LIFO costs under perpetual inventory system

OBJ. 2, 3

The following units of an item were available for sale during the year:

Beginning inventory	3,600 units at \$4.00
Sale	2,400 units at \$8.00
First purchase	8,000 units at \$4.20
Sale	6,000 units at \$8.00
Second purchase	7,500 units at \$4.40
Sale	5,500 units at \$8.00

The firm uses the perpetual inventory system, and there are 5,200 units of the item on hand at the end of the year. What is the total cost of the ending inventory according to (a) FIFO, (b) LIFO?

EX 6-8 Weighted average cost flow method under perpetual inventory system OBJ. 3

The following units of a particular item were available for sale during the calendar year:

Jan.	1	Inventory	10,000 units at \$75.00
Mar.	18	Sale	8,000 units
May	2	Purchase	18,000 units at \$77.50
Aug.	9	Sale	15,000 units
Oct.	20	Purchase	7,000 units at \$80.25

The firm uses the weighted average cost method with a perpetual inventory system. Determine the cost of merchandise sold for each sale and the inventory balance after each sale. Present the data in the form illustrated in Exhibit 6.

EX 6-9 Weighted average cost flow method under perpetual inventory system OBJ. 3

The following units of a particular item were available for sale during the calendar year:

Jan.	1	Inventory	4,000 units at \$20
Apr.	19	Sale	2,500 units
June	30	Purchase	6,000 units at \$24
Sept	. 2	Sale	4,500 units
Nov.	15	Purchase	1.000 units at \$25

The firm uses the weighted average cost method with a perpetual inventory system. Determine the cost of merchandise sold for each sale and the inventory balance after each sale. Present the data in the form illustrated in Exhibit 6.

EX 6-10 Perpetual inventory using FIFO

OBJ. 3

✓ Total Cost of Merchandise Sold, \$152,000 Assume that the business in Exercise 6-9 maintains a perpetual inventory system. Determine the cost of merchandise sold for each sale and the inventory balance after each sale, assuming the first-in, first-out method. Present the data in the form illustrated in Exhibit 4.

EX 6-11 Perpetual inventory using LIFO

OBJ. 3

✓ Total Cost of Merchandise Sold, \$158,000

✓ b. \$13,280

Assume that the business in Exercise 6-9 maintains a perpetual inventory system. Determine the cost of merchandise sold for each sale and the inventory balance after each sale, assuming the last-in, first-out method. Present the data in the form illustrated in Exhibit 5.

EX 6-12 Periodic inventory by three methods

OBJ. 2, 4

OBJ. 2, 4

The units of an item available for sale during the year were as follows:

Jan.	1	Inventory	200 units at \$60
Feb.	17	Purchase	275 units at \$64
July	21	Purchase	300 units at \$68
Nov.	23	Purchase	225 units at \$70

There are 220 units of the item in the physical inventory at December 31. The periodic inventory system is used. Determine the inventory cost by (a) the first-in, first-out method, (b) the last-in, first-out method, and (c) the weighted average cost method.

.

✓ a. Inventory, \$6,228



EX 6-13 Periodic inventory by three methods; cost of merchandise sold

The units of an item available for sale during the year were as follows:

Jan. 1	Inventory	90 units at \$54
Mar. 10	Purchase	112 units at \$55
Aug. 30	Purchase	100 units at \$58
Dec. 12	Purchase	98 units at \$60

There are 104 units of the item in the physical inventory at December 31. The periodic inventory system is used. Determine the inventory cost and the cost of merchandise sold by three methods, presenting your answers in the following form:

	Cost		
Inventory Method	Merchandise Inventory	Merchandise Sold	
a. First-in, first-out	\$	\$	
b. Last-in, first-out			
c. Weighted average cost			

EX 6-14 Comparing inventory methods

OBJ. 5

Assume that a firm separately determined inventory under FIFO and LIFO and then compared the results.

a. In each space that follows, place the correct sign [less than (<), greater than (>), or equal (=)] for each comparison, assuming periods of rising prices.

1. FIFO inventory	 LIFO inventory
2. FIFO cost of goods sold	 LIFO cost of goods sold
3. FIFO net income	 LIFO net income
4. FIFO income taxes	 LIFO income taxes

b. Why would management prefer to use LIFO over FIFO in periods of rising prices?

✓ LCM: \$37,870





EX 6-15 Lower-of-cost-or-market inventory

OBJ. 6

On the basis of the following data, determine the value of the inventory at the lower of cost or market. Assemble the data in the form illustrated in Exhibit 10.

Commodity	Inventory Quantity	Cost per Unit	Market Value per Unit (Net Realizable Value)
Ash	80	\$140	\$125
Aspen	120	90	112
Beech	30	75	74
Maple	75	88	86
Oak	60	140	145

EX 6-16 Merchandise inventory on the balance sheet

OBJ. 6

Based on the data in Exercise 6-15 and assuming that cost was determined by the FIFO method, show how the merchandise inventory would appear on the balance sheet.

EX 6-17 Effect of errors in physical inventory

OBJ. 6

Missouri River Supply Co. sells canoes, kayaks, whitewater rafts, and other boating supplies. During the taking of its physical inventory on December 31, 2016, Missouri River Supply incorrectly counted its inventory as \$233,400 instead of the correct amount of \$238,600.

- a. State the effect of the error on the December 31, 2016, balance sheet of Missouri River Supply.
- b. State the effect of the error on the income statement of Missouri River Supply for the year ended December 31, 2016.
- c. If uncorrected, what would be the effect of the error on the 2017 income statement?
- d. If uncorrected, what would be the effect of the error on the December 31, 2017, balance sheet?

EX 6-18 Effect of errors in physical inventory

OBJ. 6

Fonda Motorcycle Shop sells motorcycles, ATVs, and other related supplies and accessories. During the taking of its physical inventory on December 31, 2016, Fonda Motorcycle Shop incorrectly counted its inventory as \$337,500 instead of the correct amount of \$328,850.

- a. State the effect of the error on the December 31, 2016, balance sheet of Fonda Motorcycle Shop.
- b. State the effect of the error on the income statement of Fonda Motorcycle Shop for the year ended December 31, 2016.
- c. If uncorrected, what would be the effect of the error on the 2017 income statement?
- d. If uncorrected, what would be the effect of the error on the December 31, 2017, balance sheet?

EX 6-19 Error in inventory

OBJ. 6

During 2016, the accountant discovered that the physical inventory at the end of 2015 had been understated by \$42,750. Instead of correcting the error, however, the accountant assumed that the error would balance out (correct itself) in 2016.

Are there any flaws in the accountant's assumption? Explain.

EX 6-20 Inventory turnover

OBJ. 7



The following data (in thousands) were taken from recent annual reports of Apple Inc., a manufacturer of personal computers and related products, and American Greetings Corporation, a manufacturer and distributor of greeting cards and related products:

	Apple	American Greetings
Cost of goods sold	\$87,846,000	\$741,645
Inventory, end of year	791,000	208,945
Inventory, beginning of the year	776,000	179,730

- a. Determine the inventory turnover for Apple and American Greetings. Round to one decimal place.
- b. Would you expect American Greetings' inventory turnover to be higher or lower than Apple's? Why?

EX 6-21 Inventory turnover and number of days' sales in inventory

OBJ. 7

✓ a. Kroger, 26 days' sales in inventory







Kroger, Safeway Inc., and Whole Foods Markets, Inc. are three grocery chains in the United States. Inventory management is an important aspect of the grocery retail business. Recent balance sheets for these three companies indicated the following merchandise inventory information:

Merchandise Inventory

	End of Year (in millions)	Beginning of Year (in millions)
Kroger	\$5,114	\$4,966
Safeway	2,470	2,623
Whole Foods	374	337

The cost of goods sold for each company was:

	Cost of Goods Sold (in millions)
Kroger	\$71,494
Safeway	31,837
Whole Foods	11,699

- a. Determine the number of days' sales in inventory (use 365 days and round to the nearest day) and the inventory turnover (round to one decimal place) for the three companies.
- b. Interpret your results in part (a).
- c. If Kroger had Whole Foods' number of days' sales in inventory, how much additional cash flow (rounded to nearest million) would have been generated from the smaller inventory relative to its actual average inventory position?

Appendix

EX 6-22 Retail method

A business using the retail method of inventory costing determines that merchandise inventory at retail is \$1,235,000. If the ratio of cost to retail price is 54%, what is the amount of inventory to be reported on the financial statements?

Appendix

EX 6-23 Retail method

A business using the retail method of inventory costing determines that merchandise inventory at retail is \$396,400. If the ratio of cost to retail price is 61%, what is the amount of inventory to be reported on the financial statements?

Appendix

EX 6-24 Retail method

A business using the retail method of inventory costing determines that merchandise inventory at retail is \$775,000. If the ratio of cost to retail price is 66%, what is the amount of inventory to be reported on the financial statements?

X

Appendix

EX 6-25 Retail method

On the basis of the following data, estimate the cost of the merchandise inventory at June 30 by the retail method:

		Cost	Retail
June 1	Merchandise inventory	\$ 165,000	\$ 275,000
June 1-30	Purchases (net)	2,361,500	3,800,000
June 1-30	Sales		3,550,000

Appendix

EX 6-26 Gross profit method

✓ a. Merchandise destroyed: \$414,000

The merchandise inventory was destroyed by fire on December 13. The following data were obtained from the accounting records:

Jan. 1	Merchandise inventory	\$ 350,000
Jan. 1–Dec. 13	Purchases (net)	2,950,000
	Sales	4,440,000
	Estimated gross profit rate	35%

- a. Estimate the cost of the merchandise destroyed.
- b. Briefly describe the situations in which the gross profit method is useful.

Appendix

EX 6-27 Gross profit method

Based on the following data, estimate the cost of the ending merchandise inventory:

Sales	\$9,250,000
Estimated gross profit rate	36%
Beginning merchandise inventory	\$ 180,000
Purchases (net)	5,945,000
Merchandise available for sale	\$6,125,000

Appendix

EX 6-28 Gross profit method

Based on the following data, estimate the cost of the ending merchandise inventory:

Sales	\$1,450,000
Estimated gross profit rate	42%
Beginning merchandise inventory	\$ 100,000
Purchases (net)	860,000
Merchandise available for sale	\$ 960,000

Problems: Series A

PR 6-1A FIFO perpetual inventory

OBJ. 2, 3

√ 3. \$2,286,750





The beginning inventory at Funky Party Supplies and data on purchases and sales for a three-month period ending March 31, 2016, are as follows:

Date	Transaction	Number of Units	Per Unit	Total
Jan. 1	Inventory	2,500	\$60.00	\$150,000
10	Purchase	7,500	68.00	510,000
28	Sale	3,750	120.00	450,000
30	Sale	1,250	120.00	150,000

Date	Transaction	Number of Units	Per Unit	Total
Feb. 5	Sale	500	\$120.00	\$ 60,000
10	Purchase	18,000	70.00	1,260,000
16	Sale	9,000	125.00	1,125,000
28	Sale	8,500	125.00	1,062,500
Mar. 5	Purchase	15,000	71.60	1,074,000
14	Sale	10,000	125.00	1,250,000
25	Purchase	2,500	72.00	180,000
30	Sale	8,750	125.00	1,093,750

Instructions

- 1. Record the inventory, purchases, and cost of merchandise sold data in a perpetual inventory record similar to the one illustrated in Exhibit 4, using the first-in, first-out method.
- Determine the total sales and the total cost of merchandise sold for the period. Journalize the entries in the sales and cost of merchandise sold accounts. Assume that all sales were on account.
- 3. Determine the gross profit from sales for the period.
- 4. Determine the ending inventory cost as of March 31, 2016.
- 5. Based upon the preceding data, would you expect the inventory using the last-in, first-out method to be higher or lower?

PR 6-2A LIFO perpetual inventory

OBJ. 2, 3

The beginning inventory at Funky Party Supplies and data on purchases and sales for a three-month period are shown in Problem 6-1A.

Instructions

- 1. Record the inventory, purchases, and cost of merchandise sold data in a perpetual inventory record similar to the one illustrated in Exhibit 5, using the last-in, first-out method
- 2. Determine the total sales, the total cost of merchandise sold, and the gross profit from sales for the period.
- 3. Determine the ending inventory cost as of March 31, 2016.

PR 6-3A Weighted average cost method with perpetual inventory

OBJ. 2, 3

The beginning inventory for Funky Party Supplies and data on purchases and sales for a three-month period are shown in Problem 6-1A.

Instructions

- 1. Record the inventory, purchases, and cost of merchandise sold data in a perpetual inventory record similar to the one illustrated in Exhibit 6, using the weighted average cost method.
- 2. Determine the total sales, the total cost of merchandise sold, and the gross profit from sales for the period.
- 3. Determine the ending inventory cost as of March 31, 2016.

PR 6-4A Periodic inventory by three methods

OBJ. 2, 3

The beginning inventory for Funky Party Supplies and data on purchases and sales for a three-month period are shown in Problem 6-1A.

Instructions

- 1. Determine the inventory on March 31, 2016, and the cost of goods sold for the three-month period, using the first-in, first-out method and the periodic inventory system.
- 2. Determine the inventory on March 31, 2016, and the cost of goods sold for the three-month period, using the last-in, first-out method and the periodic inventory system.

(Continued)

✓ 2. Gross profit, \$2,252,250





✓ 2. Gross profit, \$2,284,250

✓ 2. Inventory, \$235,000 ✓ 1. \$10,700

- 3. Determine the inventory on March 31, 2016, and the cost of goods sold for the threemonth period, using the weighted average cost method and the periodic inventory system. Round the weighted average unit cost to the nearest cent.
- 4. Compare the gross profit and the March 31, 2016, inventories, using the following column headings:

	FIFO	LIFO	Weighted Average
Sales			
Cost of merchandise sold			
Gross profit			
Inventory, March 31, 2016			

PR 6-5A Periodic inventory by three methods

OBJ. 2, 4

Dymac Appliances uses the periodic inventory system. Details regarding the inventory of appliances at November 1, 2015, purchases invoices during the next 12 months, and the inventory count at October 31, 2016, are summarized as follows:

Purchases Invoices Inventory Count, Inventory. Model November 1 1st 2nd 3rd October 31 A10 4 at \$ 64 4 at \$ 70 4 at \$ 76 6 B15 8 at \$176 4 at 158 3 at 170 8 6 at 184 E60 3 at 75 3 at 65 15 at 68 9 at 70 5 G83 7 at 242 6 at 250 5 at 260 10 at 259 9 12 at 240 15 J34 10 at 246 16 at 267 16 at 270 M90 2 at 108 2 at 110 3 at 128 5 3 at 130 5 at 160 4 at 170 8 070 4 at 175 7 at 180

Instructions

1. Determine the cost of the inventory on October 31, 2016, by the first-in, first-out method. Present data in columnar form, using the following headings:

Model	Quantity	Unit Cost	Total Cost

If the inventory of a particular model comprises one entire purchase plus a portion of another purchase acquired at a different unit cost, use a separate line for each purchase.

- 2. Determine the cost of the inventory on October 31, 2016, by the last-in, first-out method, following the procedures indicated in (1).
- 3. Determine the cost of the inventory on October 31, 2016, by the weighted average cost method, using the columnar headings indicated in (1).
- 4. Discuss which method (FIFO or LIFO) would be preferred for income tax purposes in periods of (a) rising prices and (b) declining prices.

PR 6-6A Lower-of-cost-or-market inventory

OBJ. 6

✓ Total LCM, \$39,873

Data on the physical inventory of Ashwood Products Company as of December 31, 2016, follows:

Description	Inventory Quantity	Market Value per Unit (Net Realizable Value)
B12	38	\$ 57
E41	18	180
G19	33	126
L88	18	550
N94	400	7
P24	90	18
R66	8	250
T33	140	20
Z16	15	752

Quantity and cost data from the last purchases invoice of the year and the next-to-the-last purchases invoice are summarized as follows:

	Last Purchases Invoice			Next-to-the-Last Purchases Invoice		
Description	Quantity Purchased	Unit Cost	Quantity Purchased	Unit Cost		
B12	30	\$ 60	30	\$ 59		
E41	35	178	20	180		
G19	20	128	25	129		
L88	10	563	10	560		
N94	500	8	500	7		
P24	80	22	50	21		
R66	5	248	4	260		
T33	100	21	100	19		
Z16	10	750	9	745		

Instructions

Determine the inventory at cost and also at the lower of cost or market, using the first-in, first-out method. Record the appropriate unit costs on the inventory sheet, and complete the pricing of the inventory. When there are two different unit costs applicable to an item, proceed as follows:

- 1. Draw a line through the quantity, and insert the quantity and unit cost of the last purchase.
- 2. On the following line, insert the quantity and unit cost of the next-to-the-last purchase.
- 3. Total the cost and market columns and insert the lower of the two totals in the Lower of C or M column. The first item on the inventory sheet has been completed as an example.

Inventory Sheet
December 31, 2016

			Market Value per		Total	
Description	Inventory Quantity	Cost per Unit	Unit (Net Realizable Value)	Cost	Market	Lower of C or M
B12	38 30	\$60	\$57	\$1,800	\$1,710	
	8	59	57	472	456	
				\$2,272	\$2,166	\$2,166

Appendix

PR 6-7A Retail method; gross profit method

✓ 1. \$483,600

Selected data on merchandise inventory, purchases, and sales for Celebrity Tan Co. and Ranchworks Co. are as follows:

		Cost		Retail
Celebrity Tan				
Merchandise inventory, August 1	\$	300,000	\$	575,000
Transactions during August:				
Purchases (net)		2,149,000	3	,170,000
Sales			3	,250,000
Ranchworks Co.				
Merchandise inventory, March 1	\$	880,000		
Transactions during March through November:				
Purchases (net)		9,500,000		
Sales	1.	5,800,000		
Estimated gross profit rate		38%		

(Continued)

Instructions

- 1. Determine the estimated cost of the merchandise inventory of Celebrity Tan Co. on August 31 by the retail method, presenting details of the computations.
- 2. a. Estimate the cost of the merchandise inventory of Ranchworks Co. on November 30 by the gross profit method, presenting details of the computations.
 - b. Assume that Ranchworks Co. took a physical inventory on November 30 and discovered that \$369,750 of merchandise was on hand. What was the estimated loss of inventory due to theft or damage during March through November?

Problems: Series B

PR 6-1B FIFO perpetual inventory

OBJ. 2, 3

The beginning inventory of merchandise at Dunne Co. and data on purchases and sales for a three-month period ending June 30, 2016, are as follows:

			Number	Per	
Date		Transaction	of Units	Unit	Total
Apr.	3	Inventory	25	\$1,200	\$ 30,000
	8	Purchase	75	1,240	93,000
1	11	Sale	40	2,000	80,000
3	30	Sale	30	2,000	60,000
May	8	Purchase	60	1,260	75,600
1	10	Sale	50	2,000	100,000
1	19	Sale	20	2,000	40,000
2	28	Purchase	80	1,260	100,800
June	5	Sale	40	2,250	90,000
1	16	Sale	25	2,250	56,250
2	21	Purchase	35	1,264	44,240
2	28	Sale	44	2,250	99,000

Instructions

- 1. Record the inventory, purchases, and cost of merchandise sold data in a perpetual inventory record similar to the one illustrated in Exhibit 4, using the first-in, first-out method.
- 2. Determine the total sales and the total cost of merchandise sold for the period. Journalize the entries in the sales and cost of merchandise sold accounts. Assume that all sales were on account.
- 3. Determine the gross profit from sales for the period.
- 4. Determine the ending inventory cost on June 30, 2016.
- 5. Based upon the preceding data, would you expect the inventory using the last-in, first-out method to be higher or lower?

PR 6-2B LIFO perpetual inventory

OBJ. 2, 3

The beginning inventory for Dunne Co. and data on purchases and sales for a three-month period are shown in Problem 6-1B.

Instructions

- Record the inventory, purchases, and cost of merchandise sold data in a perpetual inventory record similar to the one illustrated in Exhibit 5, using the last-in, first-out method.
- 2. Determine the total sales, the total cost of merchandise sold, and the gross profit from sales for the period.
- 3. Determine the ending inventory cost on June 30, 2016.

✓ 3. \$214,474





✓ 2. Gross profit, \$213,170





2. Gross profit, \$214,396

\$31,240

PR 6-3B Weighted average cost method with perpetual inventory

OBJ. 2, 3

The beginning inventory for Dunne Co. and data on purchases and sales for a three-month period are shown in Problem 6-1B.

Instructions

- 1. Record the inventory, purchases, and cost of merchandise sold data in a perpetual inventory record similar to the one illustrated in Exhibit 6, using the weighted average cost method.
- 2. Determine the total sales, the total cost of merchandise sold, and the gross profit from sales for the period.
- 3. Determine the ending inventory cost on June 30, 2016.

PR 6-4B Periodic inventory by three methods

OBJ. 2, 3

2. Inventory, The beginning inventory for Dunne Co. and data on purchases and sales for a three-month period are shown in Problem 6-1B.

Instructions

- 1. Determine the inventory on June 30, 2016, and the cost of goods sold for the threemonth period, using the first-in, first-out method and the periodic inventory system.
- 2. Determine the inventory on June 30, 2016, and the cost of goods sold for the threemonth period, using the last-in, first-out method and the periodic inventory system.
- 3. Determine the inventory on June 30, 2016, and the cost of goods sold for the threemonth period, using the weighted average cost method and the periodic inventory system. Round the weighted average unit cost to the dollar.
- 4. Compare the gross profit and June 30, 2016, inventories using the following column headings:

	FIFO	LIFO	Weighted Average
Sales			
Cost of merchandise sold			
Gross profit			
Inventory, June 30, 2016			

PR 6-5B Periodic inventory by three methods

OBJ. 2, 4

Pappa's Appliances uses the periodic inventory system. Details regarding the inventory of appliances at January 1, 2016, purchases invoices during the year, and the inventory count at December 31, 2016, are summarized as follows:

√ 1. \$18,545

			Purchases Invoices						
Model		ntory, iary 1	1	st	21	nd	31	rd	Inventory Count, December 31
C55	3 at \$	1,040	3 at \$	1,054	3 at \$	1,060	3 at \$	1,070	4
D11	9 at	639	7 at	645	6 at	666	6 at	675	11
F32	5 at	240	3 at	260	1 at	260	1 at	280	2
H29	6 at	305	3 at	310	3 at	316	4 at	317	4
K47	6 at	520	8 at	531	4 at	549	6 at	542	8
S33	_	_	4 at	222	4 at	232	-	_	2
X74	4 at	35	6 at	36	8 at	37	7 at	39	7

Instructions

1. Determine the cost of the inventory on December 31, 2016, by the first-in, first-out method. Present data in columnar form, using the following headings:

	Total Cost	Unit Cost	Quantity	Model
(Continued)				

If the inventory of a particular model comprises one entire purchase plus a portion of another purchase acquired at a different unit cost, use a separate line for each purchase.

- 2. Determine the cost of the inventory on December 31, 2016, by the last-in, first-out method, following the procedures indicated in (1).
- 3. Determine the cost of the inventory on December 31, 2016, by the weighted average cost method, using the columnar headings indicated in (1).
- 4. Discuss which method (FIFO or LIFO) would be preferred for income tax purposes in periods of (a) rising prices and (b) declining prices.

PR 6-6B Lower-of-cost-or-market inventory

OBJ. 6

✓ Total LCM, \$41,873

Data on the physical inventory of Katus Products Co. as of December 31, 2016, follows:

Description	Inventory Quantity	Market Value per Unit (Net Realizable Value)
A54	37	\$ 56
C77	24	178
F66	30	132
H83	21	545
K12	375	5
Q58	90	18
S36	8	235
V97	140	20
Y88	17	744

Quantity and cost data from the last purchases invoice of the year and the next-to-the-last purchases invoice are summarized as follows:

		Last Purchases Invoice		Next-to-the-Last Purchases Invoice		
Description	Quantity Purchased	Unit Cost	Quantity Purchased	Unit Cost		
A54	30	\$ 60	40	\$ 58		
C77	25	174	15	180		
F66	20	130	15	128		
H83	6	547	15	540		
K12	500	6	500	7		
Q58	75	25	80	26		
S36	5	256	4	260		
V97	100	17	115	16		
Y88	10	750	8	740		

Instructions

Determine the inventory at cost and also at the lower of cost or market, using the first-in, first-out method. Record the appropriate unit costs on the inventory sheet, and complete the pricing of the inventory. When there are two different unit costs applicable to an item:

- 1. Draw a line through the quantity, and insert the quantity and unit cost of the last purchase.
- 2. On the following line, insert the quantity and unit cost of the next-to-the-last purchase.
- 3. Total the cost and market columns and insert the lower of the two totals in the Lower of C or M column. The first item on the inventory sheet has been completed as an example.

inventory	sneet
December 3	1, 2016

Market Value per					Total	,
Description	Unit Inventory Quantity	Cost per Unit	Unit (Net Realizable Value)	Cost	Market	LCM
A54	37 30	60	\$56	\$1,800	\$1,680	
	7	58	56	406	392	
				\$2,206	\$2,072	\$2,072

Appendix

PR 6-7B Retail method; gross profit method

1. \$630,000

Selected data on merchandise inventory, purchases, and sales for Jaffe Co. and Coronado Co. are as follows:

	Cost	Retail
Jaffe Co.		
Merchandise inventory, February 1	\$ 400,000	\$ 615,000
Transactions during February:		
Purchases (net)	4,055,000	5,325,000
Sales		5,100,000
Coronado Co.		
Merchandise inventory, May 1	\$ 400,000	
Transactions during May thru October:		
Purchases (net)	3,150,000	
Sales	4,750,000	
Estimated gross profit rate	35%	

Instructions

- 1. Determine the estimated cost of the merchandise inventory of Jaffe Co. on February 28 by the retail method, presenting details of the computations.
- 2. a. Estimate the cost of the merchandise inventory of Coronado Co. on October 31 by the gross profit method, presenting details of the computations.
 - b. Assume that Coronado Co. took a physical inventory on October 31 and discovered that \$366,500 of merchandise was on hand. What was the estimated loss of inventory due to theft or damage during May thru October?

Cases & Projects



CP 6-1 Ethics and professional conduct in business

Anstead Co. is experiencing a decrease in sales and operating income for the fiscal year ending October 31, 2016. Ryan Frazier, controller of Anstead Co., has suggested that all orders received before the end of the fiscal year be shipped by midnight, October 31, 2016, even if the shipping department must work overtime. Because Anstead Co. ships all merchandise FOB shipping point, it would record all such shipments as sales for the year ending October 31, 2016, thereby offsetting some of the decreases in sales and operating income.

Discuss whether Ryan Frazier is behaving in a professional manner.

CP 6-2 LIFO and inventory flow

The following is an excerpt from a conversation between Paula Marlo, the warehouse manager for Musick Foods Wholesale Co., and its accountant, Mike Hayes. Musick Foods operates a large regional warehouse that supplies produce and other grocery products to grocery stores in smaller communities.

Paula: Mike, can you explain what's going on here with these monthly statements?

Mike: Sure, Paula. How can I help you?

Paula: I don't understand this last-in, first-out inventory procedure. It just doesn't make sense.

Mike: Well, what it means is that we assume that the last goods we receive are the first ones sold. So the inventory consists of the items we purchased first.

Paula: Yes, but that's my problem. It doesn't work that way! We always distribute the oldest produce first. Some of that produce is perishable! We can't keep any of it very long or it'll spoil.

(Continued)

Mike: Paula, you don't understand. We only assume that the products we distribute are the last ones received. We don't actually have to distribute the goods in this way.

Paula: I always thought that accounting was supposed to show what really happened. It all sounds like "make believe" to me! Why not report what really happens?



Respond to Paula's concerns.

CP 6-3 Costing inventory

Golden Eagle Company began operations in 2016 by selling a single product. Data on purchases and sales for the year were as follows:

Purchases:			
Date	Units Purchased	Unit Cost	Total Cost
April 6	31,000	\$36.60	\$1,134,600
May 18	33,000	39.00	1,287,000
June 6	40,000	39.60	1,584,000
July 10	40,000	42.00	1,680,000
August 10	27,200	42.75	1,162,800
October 25	12,800	43.50	556,800
November 4	8,000	44.85	358,800
December 10	8,000	48.00	384,000
	200,000		\$8,148,000

Sales:	
April	16,000 units
May	16,000
June	20,000
July	24,000
August	28,000
September	28,000
October	18,000
November	10,000
December	8,000
Total units	168,000
Total sales	\$10,000,000

On January 4, 2017, the president of the company, Connie Kilmer, asked for your advice on costing the 32,000-unit physical inventory that was taken on December 31, 2016. Moreover, since the firm plans to expand its product line, she asked for your advice on the use of a perpetual inventory system in the future.

- 1. Determine the cost of the December 31, 2016, inventory under the periodic system, using the (a) first-in, first-out method, (b) last-in, first-out method, and (c) weighted average cost method.
- 2. Determine the gross profit for the year under each of the three methods in (1).
- 3. a. Explain varying viewpoints why each of the three inventory costing methods may best reflect the results of operations for 2016.
 - b. Which of the three inventory costing methods may best reflect the replacement cost of the inventory on the balance sheet as of December 31, 2016?
 - c. Which inventory costing method would you choose to use for income tax purposes? Why?
 - Discuss the advantages and disadvantages of using a perpetual inventory system. From the data presented in this case, is there any indication of the adequacy of inventory levels during the year?

CP 6-4 Inventory ratios for Dell and HP





Dell Inc. and Hewlett-Packard Development Company, L.P. (HP) are both manufacturers of computer equipment and peripherals. However, the two companies follow two different strategies. Dell follows primarily a build-to-order strategy, where the consumer orders the computer from a Web page. The order is then manufactured and shipped to the customer

within days of the order. In contrast, HP follows a build-to-stock strategy, where the computer is first built for inventory, then sold from inventory to retailers, such as **Best Buy**. The two strategies can be seen in the difference between the inventory turnover and number of days' sales in inventory ratios for the two companies. The following financial statement information is provided for Dell and HP for a recent fiscal year (in millions):

	Dell	HP
Inventory, beginning of period	\$ 1,301	\$ 7,490
Inventory, end of period	1,404	6,317
Cost of goods sold	48,260	92,385

- a. Determine the inventory turnover ratio and the number of days' sales in inventory ratio for each company. Use 365 days and round to one decimal place.
- b. Interpret the difference between the ratios for the two companies.

CP 6-5 Comparing inventory ratios for two companies





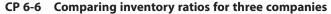
Tiffany Co. is a high-end jewelry retailer, while **Amazon.com** uses its e-commerce services, features, and technologies to sell its products through the Internet. Recent balance sheet inventory disclosures for Tiffany and Amazon.com (in millons) are as follows:

	End-of-Period Inventory	Beginning-of-Period Inventory
Tiffany Co.	\$2,073	\$1,625
Amazon.com	6,031	4,992

The cost of merchandise sold reported by each company was as follows:

	Tiffany Co.	Amazon.com
Cost of merchandise sold	\$1,492	\$45,971

- a. Determine the inventory turnover and number of days' sales in inventory for Tiffany and Amazon.com. Use 365 days and round to two decimal places.
- b. Interpret your results.







The general merchandise retail industry has a number of segments represented by the following companies:

Company Name	Merchandise Concept
Costco Wholesale Corporation	Membership warehouse
Walmart	Discount general merchandise
JCPennev	Department store

For a recent year, the following cost of merchandise sold and beginning and ending inventories have been provided from corporate annual reports (in millions) for these three companies:

	Costco	Walmart	JCPenney
Cost of merchandise sold	\$86,823	\$335,127	\$11,042
Merchandise inventory, beginning	6,638	36,437	3,213
Merchandise inventory, ending	7,096	40,714	2,916

- a. Determine the inventory turnover ratio for all three companies. Round to one decimal place.
- b. Determine the number of days' sales in inventory for all three companies. Use 365 days and round to one decimal place.
- c. Interpret these results based on each company's merchandise concept.



Sarbanes-Oxley, Internal Control, and Cash

eBay Inc.

ontrols are a part of your everyday life. At one extreme, laws are used to limit your behavior. For example, speed limits are designed to control your driving for traffic safety. In addition, you may also use many nonlegal controls. For example, you can keep credit card receipts in order to compare your transactions to the monthly credit card statement. Comparing receipts to the monthly statement is a control designed to catch mistakes made by the credit card company. In addition, banks give you a personal identification number (PIN) as a control against unauthorized access to your cash if you lose your automated teller machine (ATM) card. Dairies use freshness dating on their milk containers as a control to prevent the purchase or sale of soured milk. As you can see, you use and encounter controls every day.

Just as there are many examples of controls throughout society, businesses must also implement controls to help guide the behavior of their managers, employees, and customers. For example, **eBay Inc.** maintains an Internet-based marketplace for

the sale of goods and services. Using eBay's online platform, buyers and sellers can browse, buy, and sell a wide variety of items including antiques and used cars. However, in order to maintain the integrity and trust of its buyers and sellers, eBay must have controls to ensure that buyers pay for their items and sellers don't misrepresent their items or fail to deliver sales. One such control eBay uses is a feedback forum that establishes buyer and seller reputations. A prospective buyer or seller can view the member's reputation and feedback comments before completing a transaction. Dishonest or unfair trading can lead to a negative reputation and even suspension or cancellation of the member's ability to trade on eBay.

This chapter discusses controls that can be included in accounting systems to provide reasonable assurance that the financial statements are reliable. Controls to discover and prevent errors to a bank account are also discussed. This chapter begins by discussing the Sarbanes-Oxley Act and its impact on controls and financial reporting.

Learning Objectives				
After studying this chapter, you should be able to:	Example Exercises			
Describe the Sarbanes-Oxley Act and its impact on internal controls and financial reportions Sarbanes-Oxley Act	ing.			
Describe and illustrate the objectives and elements of internal control. Internal Control Objectives of Internal Control Elements of Internal Control Control Environment Risk Assessment Control Procedures Monitoring Information and Communication Limitations of Internal Control	EE 7-1 EE 7-1 EE 7-1 EE 7-1 EE 7-1			
Describe and illustrate the application of internal controls to cash. Cash Controls Over Receipts and Payments Control of Cash Receipts Control of Cash Payments				
Describe the nature of a bank account and its use in controlling cash. Bank Accounts Bank Statement Using the Bank Statement as a Control Over Cash	EE 7-2			
Describe and illustrate the use of a bank reconciliation in controlling cash. Bank Reconciliation	EE 7-3			
Describe the accounting for special-purpose cash funds. Special-Purpose Cash Funds	EE 7-4			
Describe and illustrate the reporting of cash and cash equivalents in the financial statements. Financial Statement Reporting of Cash				
Describe and illustrate the use of the ratio of cash to monthly cash expenses to assess the ability of a company to continue in business. Financial Analysis and Interpretation: Ratio of Cash to Monthly Cash Expenses At a Gl	EE 7-5 ance 7 Page 342			



internal controls and

financial reporting.

Sarbanes-Oxley Act

During recent financial scandals, stockholders, creditors, and other investors lost billions of dollars.¹ As a result, the U.S. Congress passed the **Sarbanes-Oxley Act**. This act is one of the most important laws affecting U.S. companies in recent history. The purpose of Sarbanes-Oxley is to maintain public confidence and trust in the financial reporting of companies.

Sarbanes-Oxley applies only to companies whose stock is traded on public exchanges, referred to as *publicly held companies*. However, Sarbanes-Oxley highlighted the importance of assessing the financial controls and reporting of all companies. As a result, companies of all sizes have been influenced by Sarbanes-Oxley.

Sarbanes-Oxley emphasizes the importance of effective internal control.² **Internal control** is defined as the procedures and processes used by a company to:

- Safeguard its assets.
- · Process information accurately.
- Ensure compliance with laws and regulations.

Sarbanes-Oxley requires companies to maintain effective internal controls over the recording of transactions and the preparing of financial statements. Such controls

¹ Exhibit 2 in Chapter 1 briefly summarizes these scandals.

² Sarbanes-Oxley also has important implications for corporate governance and the regulation of the public accounting profession. This chapter, however, focuses on the internal control implications of Sarbanes-Oxley.

are important because they deter fraud and prevent misleading financial statements as shown in Exhibit 1.

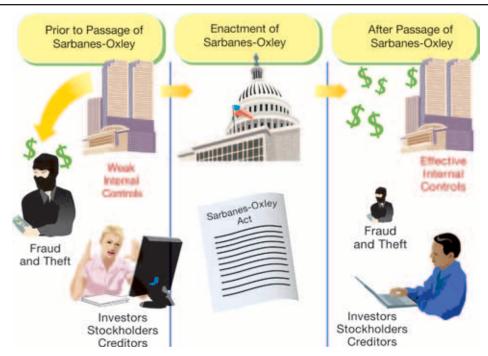


EXHIBIT 1

Effect of Sarbanes-Oxlev

Sarbanes-Oxley also requires companies and their independent accountants to report on the effectiveness of the company's internal controls.³ These reports are required to be filed with the company's annual 10-K report with the Securities and Exchange Commission. Companies are also encouraged to include these reports in their annual reports to stockholders. An example of such a report by the management of Nike is shown in Exhibit 2.

Management's Annual Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting....

Under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, our management conducted an evaluation of the effectiveness of our internal control over financial reporting based upon the framework in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on that evaluation, our management concluded that our internal control over financial reporting is effective. . . .

Pricewaterhouse Coopers LLP, an independent registered public accounting firm, has audited \dots the effectiveness of our internal control over financial reporting \dots as stated in their report. \dots

MARK G. PARKER
Chief Executive Officer and President

DONALD W. BLAIR
Chief Financial Officer

Source: Nike, Form 10-K For the Fiscal Year Ended May 31, 2013.

Exhibit 2 indicates that Nike based its evaluation of internal controls on *Internal Control—Integrated Framework*, which was issued by the Committee of Sponsoring Organizations (COSO) of the Treadway Commission. This framework is the standard by which companies design, analyze, and evaluate internal controls. For this reason, this framework is used as the basis for discussing internal controls.

³ These reporting requirements are required under Section 404 of the act. As a result, these requirements and reports are often referred to as 404 requirements and 404 reports.

EXHIBIT 2

Sarbanes-Oxley Report of Nike





Internal Control

Internal Control—Integrated Framework is the standard by which companies design, analyze, and evaluate internal control.⁴ In this section, the objectives of internal control are described, followed by a discussion of how these objectives can be achieved through the Integrated Framework's five elements of internal control.

Objectives of Internal Control

The objectives of internal control are to provide reasonable assurance that:

- Assets are safeguarded and used for business purposes.
- Business information is accurate.
- Employees and managers comply with laws and regulations.

These objectives are illustrated in Exhibit 3.

EXHIBIT 3

Objectives of Internal Control



Internal control can safeguard assets by preventing theft, fraud, misuse, or misplacement. A serious concern of internal control is preventing employee fraud. Employee fraud is the intentional act of deceiving an employer for personal gain. Such fraud may range from minor overstating of a travel expense report to stealing millions of dollars. Employees stealing from a business often adjust the accounting records in order to hide their fraud. Thus, employee fraud usually affects the accuracy of business information.

Accurate information is necessary to successfully operate a business. Businesses must also comply with laws, regulations, and financial reporting standards. Examples of such standards include environmental regulations, safety regulations, and generally accepted accounting principles (GAAP).



Business 🔀 Connection

EMPLOYEE FRAUD

The Association of Fraud Examiners estimates that 5% of annual revenues worldwide or more than \$3.5 trillion is lost to employee fraud. A common cash receipts employee fraud can occur when employees accept cash payments from customers, do not record the sale, and then pocket the cash. A common cash payments employee fraud can occur when employees bill their employer for false services or personal items.

Source: 2012 Report to the Nation on Occupational Fraud and Abuse, Association of Fraud Examiners.

Elements of Internal Control

The three internal control objectives can be achieved by applying the five elements of internal control set forth by the *Integrated Framework*. These elements are as follows:

- Control environment
- Risk assessment

⁴ Internal Control—Integrated Framework by the Committee of Sponsoring Organizations of the Treadway Commission, 2013.

⁵ Ibid., pp. 12-14.

- Control procedures
- Monitoring
- Information and communication

The elements of internal control are illustrated in Exhibit 4.



EXHIBIT 4

Elements of Internal Control

In Exhibit 4, the elements of internal control form an umbrella over the business to protect it from control threats. The control environment is the size of the umbrella. Risk assessment, control procedures, and monitoring are the fabric of the umbrella, which keep it from leaking. Information and communication connect the umbrella to management.

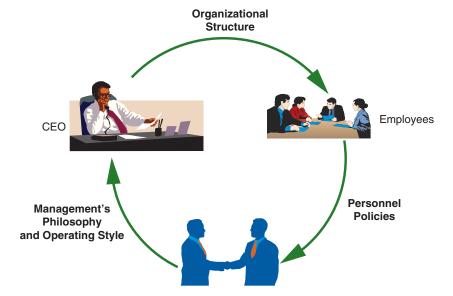
Control Environment

The **control environment** is the overall attitude of management and employees about the importance of controls. Three factors influencing a company's control environment include the following, as shown in Exhibit 5:

- Management's philosophy and operating style
- The company's organizational structure
- The company's personnel policies

EXHIBIT 5

Control Environment



Management's philosophy and operating style relates to whether management emphasizes the importance of internal controls. An emphasis on controls and adherence to control policies creates an effective control environment. In contrast, overemphasizing operating goals and tolerating deviations from control policies creates an ineffective control environment.

The business's organizational structure is the framework for planning and controlling operations. For example, a retail store chain might organize each of its stores as separate business units. Each store manager has full authority over pricing and other operating activities. In such a structure, each store manager has the responsibility for establishing an effective control environment.

The business's personnel policies involve the hiring, training, evaluation, compensation, and promotion of employees. In addition, job descriptions, employee codes of ethics, and conflict-of-interest policies are part of the personnel policies. Such policies can enhance the internal control environment if they provide reasonable assurance that only competent, honest employees are hired and retained.

Risk Assessment

All businesses face risks such as changes in customer requirements, competitive threats, regulatory changes, and changes in economic factors. Management should identify such risks, analyze their significance, assess their likelihood of occurring, and take any necessary actions to minimize them.

Control Procedures

Control procedures provide reasonable assurance that business goals will be achieved, including the prevention of fraud. Control procedures, which constitute one of the most important elements of internal control, include the following as shown in Exhibit 6:

- Competent personnel, rotating duties, and mandatory vacations
- · Separating responsibilities for related operations
- Separating operations, custody of assets, and accounting
- Proofs and security measures

EXHIBIT 6

Internal Control Procedures



Competent Personnel, Rotating Duties, and Mandatory Vacations A successful company needs competent employees who are able to perform the duties that they are assigned. Procedures should be established for properly training and supervising employees. It is also advisable to rotate duties of accounting personnel and mandate vacations for all employees. In this way, employees are encouraged to adhere to procedures. Cases of employee fraud are often discovered when a long-term employee, who never took vacations, missed work because of an illness or another unavoidable reason.

Separating Responsibilities for Related Operations The responsibility for related operations should be divided among two or more people. This decreases the possibility of errors and fraud. For example, if the same person orders supplies, verifies the receipt of the supplies, and pays the supplier, the following abuses may occur:

- Orders may be placed on the basis of friendship with a supplier, rather than on price, quality, and other objective factors.
- The quantity and quality of supplies received may not be verified; thus, the company may pay for supplies not received or that are of poor quality.
- Supplies may be stolen by the employee.
- The validity and accuracy of invoices may not be verified; hence, the company may pay false or inaccurate invoices.

For the preceding reasons, the responsibilities for purchasing, receiving, and paying for supplies should be divided among three persons or departments.

Separating Operations, Custody of Assets, and Accounting The responsibilities for operations, custody of assets, and accounting should be separated. In this way, the accounting records serve as an independent check on the operating managers and the employees who have custody of assets.

To illustrate, employees who handle cash receipts should not record cash receipts in the accounting records. To do so would allow employees to borrow or steal cash and hide the theft in the accounting records. Likewise, operating managers should not also record the results of operations. To do so would allow the managers to distort the accounting reports to show favorable results, which might allow them to receive larger bonuses.

Proofs and Security Measures Proofs and security measures are used to safeguard assets and ensure reliable accounting data. Proofs involve procedures such as authorization, approval, and reconciliation. For example, an employee planning to travel on company business may be required to complete a "travel request" form for a manager's authorization and approval.

Integrity, Objectivity, and Ethics in Business



TIPS ON PREVENTING EMPLOYEE FRAUD IN SMALL COMPANIES

- Do not have the same employee write company checks and keep the books. Look for payments to vendors you don't know or payments to vendors whose names appear to be misspelled.
- If your business has a computer system, restrict access to accounting files as much as possible. Also, keep a backup copy of your accounting files and store it at an off-site location.
- Be wary of anybody working in finance who declines to take vacations. They may be afraid that a replacement will uncover fraud.
- Require and monitor supporting documentation (such as vendor invoices) before signing checks.
- Track the number of credit card bills you sign monthly.
- Limit and monitor access to important documents and supplies, such as blank checks and signature stamps.
- Check W-2 forms against your payroll annually to make sure you're not carrying any fictitious employees.
- Rely on yourself, not on your accountant, to spot fraud.

Source: Steve Kaufman, "Embezzlement Common at Small Companies," Knight-Ridder Newspapers, reported in *Athens Daily News/Athens Banner-Herald*, March 10, 1996, p. 4D.

Documents used for authorization and approval should be prenumbered, accounted for, and safeguarded. Prenumbering of documents helps prevent transactions from being recorded more than once or not at all. In addition, accounting for and safeguarding prenumbered documents helps prevent fraudulent transactions from being recorded. For example, blank checks are prenumbered and safeguarded. Once a payment has been properly authorized and approved, the checks are filled out and issued.

Reconciliations are also an important control. Later in this chapter, the use of bank reconciliations as an aid in controlling cash is described and illustrated.

Security measures involve measures to safeguard assets. For example, cash on hand should be kept in a cash register or safe. Inventory not on display should be stored in a locked storeroom or warehouse. Accounting records such as the accounts receivable subsidiary ledger should also be safeguarded to prevent their loss. For example, electronically maintained accounting records should be safeguarded with access codes and backed up so that any lost or damaged files could be recovered if necessary.

Monitoring

Monitoring the internal control system is used to locate weaknesses and improve controls. Monitoring often includes observing employee behavior and the accounting system for indicators of control problems. Some such indicators are shown in Exhibit 7.6

EXHIBIT 7

Warning Signs of Internal Control Problems



- Abrupt change in lifestyle (without winning the lottery).
- Close social relationships with suppliers.
- Refusing to take a vacation.
- · Frequent borrowing from other employees.
- Excessive use of alcohol or drugs.



- Missing documents or gaps in transaction numbers (could mean documents are being used for fraudulent transactions).
- An unusual increase in customer refunds (refunds may be phony).
- Differences between daily cash receipts and bank deposits (could mean receipts are being pocketed before being deposited).
- Sudden increase in slow payments (employee may be pocketing the payments).
- Backlog in recording transactions (possibly an attempt to delay detection of fraud).

Evaluations of controls are often performed when there are major changes in strategy, senior management, business structure, or operations. Internal auditors, who are independent of operations, usually perform such evaluations. Internal auditors are also responsible for day-to-day monitoring of controls. External auditors also evaluate and report on internal control as part of their annual financial statement audit.

Information and Communication

Information and communication is an essential element of internal control. Information about the control environment, risk assessment, control procedures, and monitoring is used by management for guiding operations and ensuring compliance with reporting, legal, and regulatory requirements. Management also uses external

⁶ Edwin C. Bliss, "Employee Theft," Boardroom Reports, July 15, 1994, pp. 5–6.

information to assess events and conditions that impact decision making and external reporting. For example, management uses pronouncements of the Financial Accounting Standards Board (FASB) to assess the impact of changes in reporting standards on the financial statements.

Example Exercise 7-1 Internal Control Elements



Identify each of the following as relating to (a) the control environment, (b) risk assessment, or (c) control procedures:

- 1. Mandatory vacations
- 2. Personnel policies
- 3. Report of outside consultants on future market changes

Follow My Example 7-1

- 1. (c) control procedures
- 2. (a) the control environment
- 3. (b) risk assessment

Practice Exercises: PE 7-1A, PE 7-1B

Limitations of Internal Control

Internal control systems can provide only reasonable assurance for safeguarding assets, processing accurate information, and compliance with laws and regulations. In other words, internal controls are not a guarantee. This is due to the following factors:

- The human element of controls
- · Cost-benefit considerations

The *human element* recognizes that controls are applied and used by humans. As a result, human errors can occur because of fatigue, carelessness, confusion, or misjudgment. For example, an employee may unintentionally shortchange a customer or miscount the amount of inventory received from a supplier. In addition, two or more employees may collude together to defeat or circumvent internal controls. This latter case often involves fraud and the theft of assets. For example, the cashier and the accounts receivable clerk might collude to steal customer payments on account.

Cost-benefit considerations recognize that the cost of internal controls should not exceed their benefits. For example, retail stores could eliminate shoplifting by searching all customers before they leave the store. However, such a control procedure would upset customers and result in lost sales. Instead, retailers use cameras or signs saying, "We prosecute all shoplifters."

Cash Controls over Receipts and Payments

Cash includes coins, currency (paper money), checks, and money orders. Money on deposit with a bank or other financial institution that is available for withdrawal is also considered cash. Normally, you can think of cash as anything that a bank would accept for deposit in your account. For example, a check made payable to you could normally be deposited in a bank and, thus, is considered cash.

Businesses usually have several bank accounts. For example, a business might have one bank account for general cash payments and another for payroll. A separate ledger account is normally used for each bank account. For example, a bank account at City Bank could be identified in the ledger as *Cash in Bank—City Bank*. To simplify, this chapter assumes that a company has only *one* bank account, which is identified in the ledger as *Cash*.

Cash is the asset most likely to be stolen or used improperly in a business. For this reason, businesses must carefully control cash and cash transactions. Describe and illustrate the application of internal controls to cash.

Control of Cash Receipts

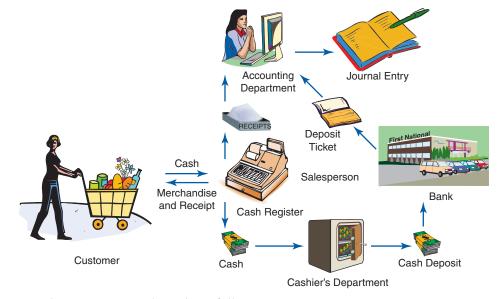
To protect cash from theft and misuse, a business must control cash from the time it is received until it is deposited in a bank. Businesses normally receive cash from two main sources.

- Customers purchasing products or services
- Customers making payments on account

Cash Received from Cash Sales An important control to protect cash received in over-the-counter sales is a cash register. The use of a cash register to control cash is shown in Exhibit 8.

EXHIBIT 8

Cash Register as a Control



A cash register controls cash as follows:

- 1. At the beginning of every work shift, each cash register clerk is given a cash drawer containing a predetermined amount of cash. This amount is used for making change for customers and is sometimes called a *change fund*.
- 2. When a salesperson enters the amount of a sale, the cash register displays the amount to the customer. This allows the customer to verify that the clerk has charged the correct amount. The customer also receives a cash receipt.
- 3. At the end of the shift, the clerk and the supervisor count the cash in the clerk's cash drawer. The amount of cash in each drawer should equal the beginning amount of cash plus the cash sales for the day.
- 4. The supervisor takes the cash to the Cashier's Department where it is placed in a safe.
- 5. The supervisor forwards the clerk's cash register receipts to the Accounting Department.
- 6. The cashier prepares a bank deposit ticket.
- 7. The cashier deposits the cash in the bank, or the cash is picked up by an armored car service, such as Wells Fargo.
- 8. The Accounting Department summarizes the cash receipts and records the day's cash sales.
- 9. When cash is deposited in the bank, the bank normally stamps a duplicate copy of the deposit ticket with the amount received. This bank receipt is returned to the Accounting Department, where it is compared to the total amount that should have been deposited. This control helps ensure that all the cash is deposited and that no cash is lost or stolen on the way to the bank. Any shortages are thus promptly detected.

Salespersons may make errors in making change for customers or in ringing up cash sales. As a result, the amount of cash on hand may differ from the amount of cash sales. Such differences are recorded in a **cash short and over account**.

To illustrate, assume the following cash register data for May 3:

Cash register total for cash sales \$35,690 Cash receipts from cash sales 35,668 The cash sales, receipts, and shortage of \$22 (\$35,690 - \$35,668) would be recorded as follows:

May	3	Cash Cash Short and Over	35,668 22		
		Sales		35,690	

If there had been cash over, Cash Short and Over would have been credited for the overage. At the end of the accounting period, a debit balance in Cash Short and Over is included in miscellaneous expense on the income statement. A credit balance is included in the Other Income section. If a salesperson consistently has large cash short and over amounts, the supervisor may require the clerk to take additional training.

Cash Received in the Mail Cash is received in the mail when customers pay their bills. This cash is usually in the form of checks and money orders. Most companies design their invoices so that customers return a portion of the invoice, called a *remittance advice*, with their payment. Remittance advices may be used to control cash received in the mail as follows:

- 1. An employee opens the incoming mail and compares the amount of cash received with the amount shown on the remittance advice. If a customer does not return a remittance advice, the employee prepares one. The remittance advice serves as a record of the cash initially received. It also helps ensure that the posting to the customer's account is for the amount of cash received.
- 2. The employee opening the mail stamps checks and money orders "For Deposit Only" in the bank account of the business.
- 3. The remittance advices and their summary totals are delivered to the Accounting Department.
- 4. All cash and money orders are delivered to the Cashier's Department.
- 5. The cashier prepares a bank deposit ticket.
- 6. The cashier deposits the cash in the bank, or the cash is picked up by an armored car service, such as Wells Fargo.
- 7. An accounting clerk records the cash received and posts the amounts to the customer accounts.
- 8. When cash is deposited in the bank, the bank normally stamps a duplicate copy of the deposit ticket with the amount received. This bank receipt is returned to the Accounting Department, where it is compared to the total amount that should have been deposited. This control helps ensure that all cash is deposited and that no cash is lost or stolen on the way to the bank. Any shortages are thus promptly detected.

Separating the duties of the Cashier's Department, which handles cash, and the Accounting Department, which records cash, is a control. If Accounting Department employees both handle and record cash, an employee could steal cash and change the accounting records to hide the theft.

Cash Received by EFT Cash may also be received from customers through **electronic funds transfer (EFT)**. For example, customers may authorize automatic electronic transfers from their checking accounts to pay monthly bills for such items as cell phone, Internet, and electric services. In such cases, the company sends the customer's bank a signed form from the customer authorizing the monthly electronic transfers. Each month, the company notifies the customer's bank of the amount of the transfer and the date the transfer should take place. On the due date, the company records the electronic transfer as a receipt of cash to its bank account and posts the amount paid to the customer's account.

Companies encourage customers to use EFT for the following reasons:

- EFTs cost less than receiving cash payments through the mail.
- EFTs enhance internal controls over cash, since the cash is received directly by the bank without any employees handling cash.
- EFTs reduce late payments from customers and speed up the processing of cash receipts.



Howard Schultz & Associates

(HS&A) specializes in reviewing cash payments for its clients. HS&A searches for errors, such as duplicate payments, failures to take discounts, and inaccurate computations. Amounts recovered for clients range from thousands to millions of dollars.

Control of Cash Payments

The control of cash payments should provide reasonable assurance that:

- Payments are made for only authorized transactions.
- Cash is used effectively and efficiently. For example, controls should ensure that all
 available purchase discounts are taken.

In a small business, an owner/manager may authorize payments based on personal knowledge. In a large business, however, purchasing goods, inspecting the goods received, and verifying the invoices are usually performed by different employees. These duties must be coordinated to ensure that proper payments are made to creditors. One system used for this purpose is the voucher system.

Voucher System A **voucher system** is a set of procedures for authorizing and recording liabilities and cash payments. A **voucher** is any document that serves as proof of authority to pay cash or issue an electronic funds transfer. An invoice that has been approved for payment could be considered a voucher. In many businesses, however, a voucher is a special form used to record data about a liability and the details of its payment.

In a manual system, a voucher is normally prepared after all necessary supporting documents have been received. For the purchase of goods, a voucher is supported by the supplier's invoice, a purchase order, and a receiving report. After a voucher is prepared, it is submitted for approval. Once approved, the voucher is recorded in the accounts and filed by due date. Upon payment, the voucher is recorded in the same manner as the payment of an account payable.

In a computerized system, data from the supporting documents (such as purchase orders, receiving reports, and suppliers' invoices) are entered directly into computer files. At the due date, the checks are automatically generated and mailed to creditors. At that time, the voucher is electronically transferred to a paid voucher file.

Cash Paid by EFT Cash can also be paid by electronic funds transfer (EFT) systems. For example, you can withdraw cash from your bank account using an ATM machine. Your withdrawal is a type of EFT transfer.

Companies also use EFT transfers. For example, many companies pay their employees via EFT. Under such a system, employees authorize the deposit of their payroll checks directly into their checking accounts. Each pay period, the company transfers the employees' net pay to their checking accounts through the use of EFT. Many companies also use EFT systems to pay their suppliers and other vendors.



Bank Accounts

A major reason that companies use bank accounts is for internal control. Some of the control advantages of using bank accounts are as follows:

- Bank accounts reduce the amount of cash on hand.
- Bank accounts provide an independent recording of cash transactions. Reconciling the balance of the cash account in the company's records with the cash balance according to the bank is an important control.
- Use of bank accounts facilitates the transfer of funds using EFT systems.

Bank Statement

Banks usually maintain a record of all checking account transactions. A summary of all transactions, called a **bank statement**, is mailed, usually each month, to the company (depositor) or made available online. The bank statement shows the beginning balance, additions, deductions, and the ending balance. A typical bank statement is shown in Exhibit 9.

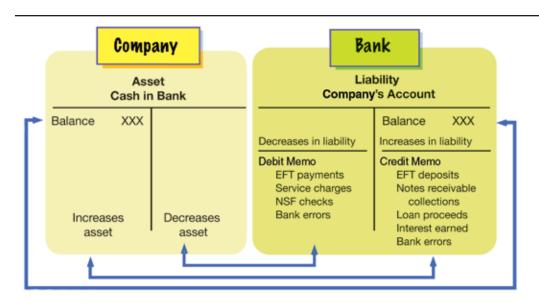
Checks or copies of the checks listed in the order that they were paid by the bank may accompany the bank statement. If paid checks are returned, they are stamped "Paid," together with the date of payment. Many banks no longer return checks or check copies. Instead, the check payment information is available online.

VALLEY NATIONAL I	MEMBER FDI	С	ACCOUNT NUMB		PAGE 1
OF LOS ANGELES	ZAINIX		FROM 6/30/15	TO 7/3	31/15
LOS ANGELES, CA 90020-4253	(310)555-5151		BALANCE	4,21	18.60
		22	DEPOSITS	13,74	19.75
		52	WITHDRAWALS	14.69	98.57
POWER NETWORKING	j.			1 1,0	30.01
1000 Belkin Street Los Angeles, CA 90014 -	1000	3	OTHER DEBITS AND CREDITS	9	90.00CR
			NEW BALANCE	3,3	59.78
* CHECKS AND OTHER DE	BITS	*	DEPOSITS -:	*-DATE * B	ALANCE *
No. 850 819.40 No. 85	2 122.54		585.75	07/01	3,862.41
No. 854 369.50 No. 85	3 20.15		421.53	07/02	3,894.29
No. 851 600.00 No. 85	6 190.70		781.30	07/03	3,884.89
No. 855 25.93 No. 85	7 52.50			07/04	3,806.46
No. 860 921.20 No. 85	8 160.00		662.50	07/05	3,387.76
No. 862 91.07 NSF	300.00		503.18	07/07	3,499.87
			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~	<u> </u>
No. 880 32.26 No. 87	7 535.09		ACH 932.00	07/29	4,136.66
No. 881 21.10 No. 87	9 732.26		705.21	07/30	4,088.5
No. 882 126.20 SC	18.00		MS 408.00	07/30	4,352.3
No. 874 26.12 ACH	1,615.13		648.72	07/31	3,359.78
EC — ERROR CORR	ECTION	ACH — AUT	OMATED CLEAR	NG HOUSE	
MS — MISCELLANE	OUS				
NSF — NOT SUFFICE	ENT FUNDS	SC — SERV	ICE CHARGE		
* * *	* * *	•		* *	* *
THE RECONCILEMEN	T OF THIS STATE	MENT WITH Y	OUR RECORDS IS	ESSENTIAL.	

**EXHIBIT 9** 

**Bank Statement** 

The company's checking account balance *in the bank records* is a liability. Thus, in the bank's records, the company's account has a credit balance. Because the bank statement is prepared from the bank's point of view, a credit memo entry on the bank statement indicates an increase (a credit) to the company's account. Likewise, a debit memo entry on the bank statement indicates a decrease (a debit) in the company's account. This relationship is shown in Exhibit 10.



### EXHIBIT 10

Checking Account: Company and Bank Perspectives A bank makes credit entries (issues credit memos) for the following:

- Deposits made by electronic funds transfer (EFT)
- Collections of notes receivable for the company
- Proceeds for a loan made to the company by the bank
- Interest earned on the company's account
- Correction (if any) of bank errors

A bank makes debit entries (issues debit memos) for the following:

- Payments made by electronic funds transfer (EFT)
- Service charges
- · Customer checks returned for not sufficient funds
- Correction (if any) of bank errors

Customers' checks returned for not sufficient funds, called *NSF checks*, are customer checks that were initially deposited but were not paid by the customer's bank. Because the company's bank credited the customer's check to the company's account when it was deposited, the bank debits the company's account (issues a debit memo) when the check is returned without payment.

The reason for a credit or debit memo entry is indicated on the bank statement. Exhibit 9 identifies the following types of credit and debit memo entries:

- EC: Error correction to correct bank error
- NSF: Not sufficient funds check
- SC: Service charge
- · ACH: Automated clearing house entry for electronic funds transfer
- MS: Miscellaneous item such as collection of a note receivable on behalf of the company or receipt of a loan by the company from the bank

The preceding list includes the notation "ACH" for electronic funds transfers. ACH is a network for clearing electronic funds transfers among individuals, companies, and banks.⁷ Because electronic funds transfers may be either deposits or payments, ACH entries may indicate either a debit or credit entry to the company's account. Likewise, entries to correct bank errors and miscellaneous items may indicate a debit or credit entry to the company's account.

# Example Exercise 7-2 Items on Company's Bank Statement



The following items may appear on a bank statement:

- 1. NSF check
- 2. EFT deposit
- 3. Service charge
- 4. Bank correction of an error from recording a \$400 check as \$40

Using the following format, indicate whether the item would appear as a debit or credit memo on the bank statement and whether the item would increase or decrease the balance of the company's account:

Appears on the Bank Statement Increases or Decreases the Balance as a Debit or Credit Memo of the Company's Bank Account

### Follow My Example 7-2

Item No.	as a Debit or Credit Memo	of the Company's Bank Account
1	debit memo	decreases
2	credit memo	increases
3	debit memo	decreases
4	debit memo	decreases

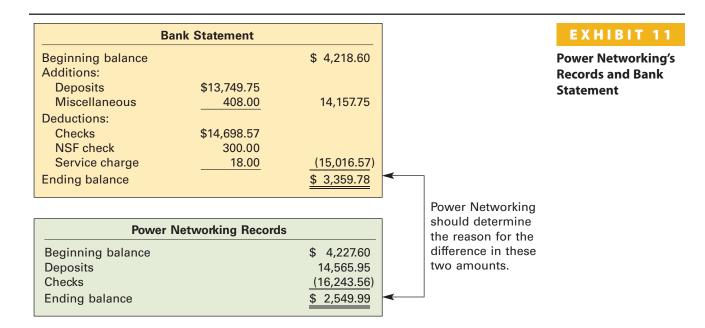
Practice Exercises: PE 7-2A, PE 7-2B

⁷ For further information on ACH, go to www.nacha.org/. Click on "ACH Network" and then click on "Intro to the ACH Network"

# **Using the Bank Statement as a Control over Cash**

The bank statement is a primary control that a company uses over cash. A company uses the bank's statement by comparing the company's recording of cash transactions to those recorded by the bank.

The cash balance shown by a bank statement is usually different from the company's cash balance, as shown in Exhibit 11.



Differences between the company and bank balance may arise because of a delay by either the company or bank in recording transactions. For example, there is normally a time lag of one or more days between the date a check is written and the date that it is paid by the bank. Likewise, there is normally a time lag between when the company mails a deposit to the bank (or uses the night depository) and when the bank receives and records the deposit.

Differences may also arise because the bank has debited or credited the company's account for transactions that the company will not know about until the bank statement is received. Finally, differences may arise from errors made by either the company or the bank. For example, the company may incorrectly post to Cash a check written for \$4,500 as \$450. Likewise, a bank may incorrectly record the amount of a check.

# **Bank Reconciliation**

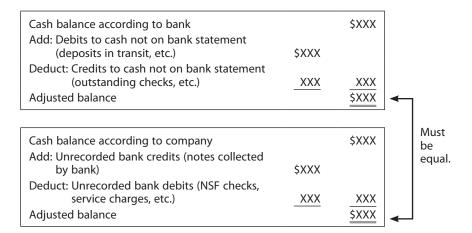
A bank reconciliation is an analysis of the items and amounts that result in the cash balance reported in the bank statement to differ from the balance of the cash account in the ledger. The adjusted cash balance determined in the bank reconciliation is reported on the balance sheet.

A bank reconciliation is usually divided into two sections as follows:

- 1. The *bank section* begins with the cash balance according to the bank statement and ends with the *adjusted balance*.
- 2. The *company section* begins with the cash balance according to the company's records and ends with the *adjusted balance*.



The *adjusted balance* from bank and company sections must be equal. The format of the bank reconciliation follows:



A bank reconciliation is prepared using steps illustrated in Exhibit 12.

### **EXHIBIT 12**

### How to Prepare a Bank Reconcilation

### **Bank Section of Reconciliation**

- Step 1. Enter the Cash balance according to bank from the ending cash balance according to the bank statement.
- Step 2. Add deposits not recorded by the bank.

  Identify deposits not recorded by the bank by comparing each deposit listed on the bank statement with unrecorded deposits appearing in the preceding period's reconciliation and with the current period's deposits.

  Examples: Deposits in transit at the end of the period.
- Step 3. Deduct outstanding checks that have not been paid by the bank.

  Identify outstanding checks by comparing paid checks with outstanding checks appearing on the preceding period's reconciliation and with recorded checks.

  Examples: Outstanding checks at the end of the period.
- Step 4. Determine the *Adjusted balance* by adding Step 2 and deducting Step 3.

### **Company Section of Reconciliation**

- Step 5. Enter the *Cash balance according to company* from the ending cash balance in the ledger.
- Step 6. Add credit memos that have not been recorded.
   Identify the bank credit memos that have not been recorded by comparing the bank statement credit memos to entries in the journal.
   Examples: A note receivable and interest that the bank has collected for the company.
- Step 7. *Deduct debit memos that have not been recorded*.

  Identify the bank debit memos that have not been recorded by comparing the bank statement debit memos to entries in the journal.

  Examples: Customers' not sufficient funds (NSF) checks; bank service charges.
- Step 8. Determine the Adjusted balance by adding Step 6 and deducting Step 7.

### Verify That Adjusted Balances Are Equal

Step 9. Verify that the adjusted balances determined in Steps 4 and 8 are equal.

The adjusted balances in the bank and company sections of the reconciliation must be equal. If the balances are not equal, an item has been overlooked and must be found. Sometimes, the adjusted balances are not equal because either the company or the bank has made an error. In such cases, the error is often discovered by comparing the amount of each item (deposit and check) on the bank statement with that in the company's records.

Any bank or company errors discovered should be added to or deducted from the bank or company section of the reconciliation, depending on the nature of the error. For example, assume that the bank incorrectly recorded a company check for \$50 as \$500. This bank error of \$450 (\$500 – \$50) would be added to the bank balance in the bank section of the reconciliation. In addition, the bank would be notified of the error so that it could be corrected. On the other hand, assume that the company recorded a deposit of \$1,200 as \$2,100. This company error of \$900 (\$2,100 – \$1,200) would be deducted from the cash balance in the company section of the bank reconciliation. The company would later correct the error using a journal entry.

To illustrate, the bank statement for Power Networking in Exhibit 9 is used. This bank statement shows a balance of \$3,359.78 as of July 31. The cash balance in Power Networking's ledger on the same date is \$2,549.99. Using the preceding steps, the following reconciling items were identified:

- Step 2. Deposit of July 31, not recorded on bank statement: \$816.20
- Step 3. Outstanding checks:

Check No. 812	\$1,061.00
Check No. 878	435.39
Check No. 883	48.60
Total	\$1,544.99

- Step 6. Note receivable of \$400 plus interest of \$8 collected by bank not recorded in the journal as indicated by a credit memo of \$408.
- Step 7. Check from customer (Thomas Ivey) for \$300 returned by bank because of insufficient funds (NSF) as indicated by a debit memo of \$300.00.

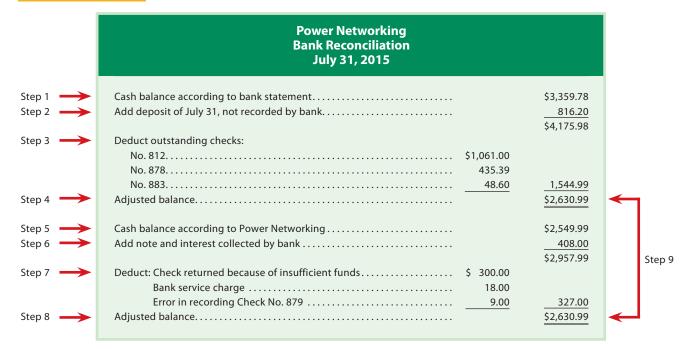
  Bank service charges of \$18, not recorded in the journal as indicated by a debit memo of \$18.00.

In addition, an error of \$9 was discovered. This error occurred when Check No. 879 for \$732.26 to Taylor Co., on account, was recorded in the company's journal as \$723.26.

The bank reconciliation, based on the Exhibit 9 bank statement and the preceding reconciling items, is shown in Exhibit 13.

### **EXHIBIT 13**

### **Bank Reconciliation for Power Networking**



The company's records do not need to be updated for any items in the *bank* section of the reconciliation. This section begins with the cash balance according to the bank statement. However, the bank should be notified of any errors that need to be corrected.

The company's records do need to be updated for any items in the *company section* of the bank reconciliation. The company's records are updated using journal entries. For example, journal entries should be made for any unrecorded bank memos and any company errors.

The journal entries for Power Networking, based on the bank reconciliation shown in Exhibit 13, are as follows:

July	31	Cash Notes Receivable Interest Revenue	408	400 8	
	31	Accounts Receivable—Thomas Ivey Miscellaneous Expense Accounts Payable—Taylor Co. Cash	300 18 9	327	

After the preceding journal entries are recorded and posted, the cash account will have a debit balance of \$2,630.99. This cash balance agrees with the adjusted balance shown on the bank reconciliation. This is the amount of cash on July 31 and is the amount that is reported on Power Networking's July 31 balance sheet.

Businesses may reconcile their bank accounts in a slightly different format from that shown in Exhibit 13. Regardless, the objective is to control cash by reconciling the company's records with the bank statement. In doing so, any errors or misuse of cash may be detected.

To enhance internal control, the bank reconciliation should be prepared by an employee who does not take part in or record cash transactions. Otherwise, mistakes may occur, and it is more likely that cash will be stolen or misapplied. For example, an employee who handles cash and also reconciles the bank statement could steal a cash deposit, omit the deposit from the accounts, and omit it from the reconciliation.

Bank reconciliations are also an important part of computerized systems where deposits and checks are stored in electronic files and records. Some systems use computer software to determine the difference between the bank statement and company cash balances. The software then adjusts for deposits in transit and outstanding checks. Any remaining differences are reported for further analysis.

# The following data were gathered to use in reconciling the bank account of Photo Op: Balance per bank. \$14,500 Balance per company records. 13,875 Bank service charges 75 Deposit in transit 3,750 NSF check. 800 Outstanding checks 5,250

- a. What is the adjusted balance on the bank reconciliation?
- b. Journalize any necessary entries for Photo Op based on the bank reconciliation.

(Continued)

### 

# Integrity, Objectivity, and Ethics in Business



### **BANK ERROR IN YOUR FAVOR**

It is possible that you may have a bank error in your favor, such as a misposted deposit. Such errors are not a case of "found money," as in the Monopoly game. Bank control

systems quickly discover most errors and make automatic adjustments. Even so, you have a legal responsibility to report the error and return the money to the bank.

# **Special-Purpose Cash Funds**



A company often has to pay small amounts for such items as postage, office supplies, or minor repairs. Although small, such payments may occur often enough to total a significant amount. Thus, it is desirable to control such payments. However, writing a check for each small payment is not practical. Instead, a special cash fund, called a **petty cash fund**, is used.

A petty cash fund is established by estimating the amount of payments needed from the fund during a period, such as a week or a month. A check is then written and cashed for this amount. The money obtained from cashing the check is then given to an employee, called the *petty cash custodian*. The petty cash custodian disburses monies from the fund as needed. For control purposes, the company may place restrictions on the maximum amount and the types of payments that can be made from the fund. Each time money is paid from petty cash, the custodian records the details on a petty cash receipts form.

The petty cash fund is normally replenished at periodic intervals, when it is depleted, or reaches a minimum amount. When a petty cash fund is replenished, the accounts debited are determined by summarizing the petty cash receipts. A check is then written for this amount, payable to Petty Cash.

To illustrate, assume that a petty cash fund of \$500 is established on August 1. The entry to record this transaction is as follows:

	Aug. 1	Petty Cash Cash	500	500	
--	--------	--------------------	-----	-----	--

The only time Petty Cash is debited is when the fund is initially established, as shown in the preceding entry, or when the fund is being increased. The only time Petty Cash is credited is when the fund is being decreased.

At the end of August, the petty cash receipts indicate expenditures for the following items:

Office supplies	\$380
Postage (debit Office Supplies)	22
Store supplies	35
Miscellaneous administrative expense	30
Total	\$467

The entry to replenish the petty cash fund on August 31 is as follows:

Aug.	31	Office Supplies	402		
		Store Supplies	35		
		Miscellaneous Administrative Expense	30		
		Cash		467	

Petty Cash is not debited when the fund is replenished. Instead, the accounts affected by the petty cash disbursements are debited, as shown in the preceding entry. Replenishing the petty cash fund restores the fund to its original amount of \$500.

Companies often use other cash funds for special needs, such as payroll or travel expenses. Such funds are called **special-purpose funds**. For example, each salesperson might be given \$1,000 for travel-related expenses. Periodically, each salesperson submits an expense report, and the fund is replenished. Special-purpose funds are established and controlled in a manner similar to that of the petty cash fund.

## Example Exercise 7-4 Petty Cash Fund

OBJ 6

Practice Exercises: PE 7-4A, PE 7-4B

Prepare journal entries for each of the following:

- a. Issued a check to establish a petty cash fund of \$500.
- b. The amount of cash in the petty cash fund is \$120. Issued a check to replenish the fund, based on the following summary of petty cash receipts: office supplies, \$300, and miscellaneous administrative expense, \$75. Record any missing funds in the cash short and over account.

Follow My Example 7-4		
a. Petty Cash	500	
Cash		500
b. Office Supplies	300	
Miscellaneous Administrative Expense	75	
Cash Short and Over	5	
Cash		380



# **Financial Statement Reporting of Cash**

Cash is normally listed as the first asset in the Current Assets section of the balance sheet. Most companies present only a single cash amount on the balance sheet by combining all their bank and cash fund accounts.

A company may temporarily have excess cash. In such cases, the company normally invests in highly liquid investments in order to earn interest. These investments are called **cash equivalents**. Examples of cash equivalents include U.S. Treasury bills, notes issued by major corporations (referred to as *commercial paper*), and money

⁸To be classified as a cash equivalent, according to FASB *Accounting Standards Codification*, Section 305.10, the investment is expected to be converted to cash within three months.

market funds. In such cases, companies usually report *Cash and cash equivalents* as one amount on the balance sheet.

The balance sheet presentation for cash for Mornin' Joe follows:

### Mornin' Joe Balance Sheet December 31, <u>2016</u>



Assets	
Current assets:  Cash and cash equivalents	\$235,000

Banks may require that companies maintain minimum cash balances in their bank accounts. Such a balance is called a **compensating balance**. This is often required by the bank as part of a loan agreement or line of credit. A *line of credit* is a preapproved amount the bank is willing to lend to a customer upon request. Compensating balance requirements are normally disclosed in notes to the financial statements.

# Financial Analysis and Interpretation: Ratio of Cash to Monthly Cash Expenses

For startup companies or companies in financial distress, cash is critical for survival. In their first few years, startup companies often report losses and negative net cash flows from operations. Moreover, companies in financial distress can also report losses and negative cash flows from operations. In such cases, the **ratio of cash to monthly cash expenses** is useful for assessing how long a company can continue to operate without:

- Describe and illustrate the use of the ratio of cash to monthly cash expenses to assess the ability of a company to continue in business.
- F-A-I

- Additional financing, or
- · Generating positive cash flows from operations

The ratio of cash to monthly cash expenses is computed as follows:

The cash, including any cash equivalents, is taken from the balance sheet as of year-end. The monthly cash expenses, sometimes called *cash burn*, are estimated from the operating activities section of the statement of cash flows as follows:

Monthly Cash Expenses = 
$$\frac{\text{Negative Cash Flow from Operations}}{12}$$

To illustrate, Ocean Power Technologies, Inc., develops and markets systems that generate electricity from the rising and falling of ocean waves. The following data (in thousands) were taken from recent financial statements of Ocean Power Technologies:

		For Years Ended April 29				
	Year 4	Year 3	Year 2	Year 1		
Cash and cash equivalents at year-end	\$ 9,353	\$4,376	\$4,237	\$ 12,268		
Cash flow from operations	(13,915)	(18,770)	(15,771)	(16,708)		

Based on the preceding data, the monthly cash expenses and ratio of cash to monthly cash expenses are computed as follows:

	For Years Ended April 29					
	Year 4	Year 3	Year 2	Year 1		
Monthly cash expenses:*						
\$13,915 ÷ 12	\$1,160					
\$18,770 ÷ 12		\$1,564				
\$15,771 ÷ 12			\$1,314			
\$16,708 ÷ 12				\$1,392		
Ratio of cash to monthly cash expenses:**						
\$9,353 ÷ \$1,160	8.1 months					
\$4,376 ÷ \$1,564		2.8 months				
\$4,237 ÷ \$1,314			3.2 months			
\$12,268 ÷ \$1,392				8.8 months		

^{*}Rounded to nearest dollar.

The preceding computations indicate that Ocean Power had 8.8 months of cash available at the end of Year 1 to continue its operations. However, at the end of Year 1 Ocean Power also had short-term investments totaling almost \$29 million. These investments had maturities greater than three months and, thus, were not included as cash equivalents. In addition, Ocean Power had more than \$40 million of long-term investments at the end of Year 1. These short- and long-term investments were generated from issuing stock of almost \$91 million two years earlier.

At the end of Year 2, Ocean Power had 3.2 months of cash available to continue its operations. During Year 2, Ocean Power sold short-term investments of almost \$8 million to continue its operations. At the end of Year 3, Ocean Power had 2.8 months of cash available to continue its operations. During Year 3, Ocean Power sold short-term investments of \$19 million to continue its operations. At the end of Year 4, Ocean Power had 8.1 months of cash available to continue its operations. During Year 4, Ocean Power sold short-term investments of almost \$20 million to continue its operations.

The preceding analysis indicates that Ocean Power has generated negative cash flows from operations in each of the last four years. During each of the last four years, Ocean Power has been selling short-term investments, which were purchased from funds received by issuing stock, to finance its operations. At the end of Year 4, Ocean Power had no long-term investments and a little more than \$22 million left in short-term investments. Unless Ocean Power can generate positive cash flows from operations in the next several years, it will have to raise additional funds from borrowing or issuing stock. On a favorable note, negative cash flows from operations decreased from \$1,564 in Year 3 to \$1,160 in Year 4.

# Financial data for Chapman Company follows: For Year Ended December 31, 2016 Cash on December 31, 2016 Cash flow from operations Cash 102,000 (144,000)

- a. Compute the ratio of cash to monthly cash expenses.
- b. Interpret the results computed in (a).

(Continued)

^{**}Rounded to one decimal place.

### Follow My Example 7-5

a. Monthly Cash Expenses = 
$$\frac{\text{Negative Cash Flow from Operations}}{12} = \frac{\$144,000}{12} = \$12,000 \text{ per month}$$

Ratio of Cash to Monthly Cash Expenses = 
$$\frac{\text{Cash as of Year-End}}{\text{Monthly Cash Expenses}} = \frac{\$102,000}{\$12,000 \text{ per month}} = 8.5 \text{ months}$$

b. The preceding computations indicate that Chapman Company has 8.5 months of cash remaining as of December 31, 2016. To continue operations beyond 8.5 months, Chapman Company will need to generate positive cash flows from operations or raise additional financing from stockholders or by issuing debt.

Practice Exercises: PE 7-5A, PE 7-5B



# 

### MICROSOFT CORPORATION

Microsoft Corporation develops, manufactures, licenses, and supports software products for computing devices. Microsoft software products include computer operating systems, such as Windows®, and application software, such as Microsoft Word® and Excel®. Microsoft is actively involved in the video game market through its Xbox® and is also involved in online products and services.

Microsoft is known for its strong cash position. The following recent balance sheet of Microsoft reported more than \$63 billion of cash and short-term investments:

### **Balance Sheet** (In millions)

Assets	
Current assets:	
Cash and equivalents	\$ 6,938
Short-term investments	_56,102
Total cash and short-term investments	\$63,040

The cash and cash equivalents of \$6,938 million are further described in the notes to the financial statements, as follows:

Cas	h :	and	ea	uiva	lents:
Cus		aria	Cq	uive	aiciics.

Cash	\$2,019
Mutual funds	820
Commercial paper	96
U.S. government and agency securities	561
Foreign government bonds	575
Certificates of deposit	342
Corporate notes and bonds	2,525
Total cash and equivalents	\$6,938

Source: Microsoft Corporation, Form 10-K For the Fiscal Year Ended June 30, 2012.

# At a Glance 7



### Describe the Sarbanes-Oxley Act and its impact on internal controls and financial reporting.

**Key Points** Sarbanes-Oxley requires companies to maintain strong and effective internal controls and to report on the effectiveness of the internal controls.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe why Congress passed Sarbanes-Oxley.		
• Describe the purpose of Sarbanes-Oxley.		
Define internal control.		



### Describe and illustrate the objectives and elements of internal control.

**Key Points** The objectives of internal control are to provide reasonable assurance that (1) assets are safeguarded and used for business purposes, (2) business information is accurate, and (3) the company is complying with laws and regulations. The elements of internal control are the control environment, risk assessment, control procedures, monitoring, and information and communication.

Learning Outcomes	Example Exercises	Practice Exercises
• List the objectives of internal control.		
• List the elements of internal control.		
<ul> <li>Describe each element of internal control and factors influencing each element.</li> </ul>	EE7-1	PE7-1A, 7-1B



### Describe and illustrate the application of internal controls to cash.

**Key Points** A cash register is a control for protecting cash received in over-the-counter sales. A remittance advice is a control for cash received through the mail. Separating the duties of handling cash and recording cash is also a control. A voucher system is a control system for cash payments. Many companies use electronic funds transfers for cash receipts and cash payments.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe and give examples of controls for cash received from cash sales, cash received in the mail, and cash received by EFT.</li> </ul>		
Describe and give examples of controls for cash payments made using a voucher system and cash payments made by EFT.		



### Describe the nature of a bank account and its use in controlling cash.

**Key Points** Bank accounts control cash by reducing the amount of cash on hand and facilitating the transfer of cash between businesses and locations. In addition, the bank statement allows a business to reconcile the cash transactions recorded in the accounting records to those recorded by the bank.

Learning Outcomes  • Describe how the use of bank accounts helps control cash.	Example Exercises EE7-2	Practice Exercises PE7-2A, 7-2B
<ul> <li>Describe a bank statement and provide examples of items that appear on a bank statement as debit and credit memos.</li> </ul>		



### Describe and illustrate the use of a bank reconciliation in controlling cash.

**Key Points** A bank reconciliation is prepared using the nine steps as summarized in Exhibit 12. The items in the company section of a bank reconciliation must be journalized on the company's records.

Learning Outcomes	Example Exercises	Practice Exercises
Describe a bank reconciliation.		
Prepare a bank reconciliation.	EE7-3	PE7-3A, 7-3B
<ul> <li>Journalize any necessary entries on the company's records, based on the bank reconciliation.</li> </ul>	EE7-3	PE7-3A, 7-3B



### Describe the accounting for special-purpose cash funds.

**Key Points** Special-purpose cash funds, such as a petty cash fund or travel funds, are used by businesses to meet specific needs. Each fund is established by cashing a check for the amount of cash needed. At periodic intervals, the fund is replenished and the disbursements recorded.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe the use of special-purpose cash funds.		
• Journalize the entry to establish a petty cash fund.	EE7-4	PE7-4A, 7-4B
• Journalize the entry to replenish a petty cash fund.	EE7-4	PE7-4A, 7-4B



### Describe and illustrate the reporting of cash and cash equivalents in the financial statements.

**Key Points** Cash is listed as the first asset in the Current assets section of the balance sheet. Companies that have invested excess cash in highly liquid investments usually report *Cash and cash equivalents* on the balance sheet.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the reporting of cash and cash equivalents in the financial statements.</li> </ul>		
• Illustrate the reporting of cash and cash equivalents in the financial statements.		



Describe and illustrate the use of the ratio of cash to monthly cash expenses to assess the ability of a company to continue in business.

**Key Points** The ratio of cash to monthly cash expenses is useful for assessing how long a company can continue to operate without (1) additional financing or (2) generating positive cash flows from operations.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the use of the ratio of cash to monthly cash expenses.</li> </ul>		
• Compute the ratio of cash to monthly cash expenses.	EE7-5	PE7-5A, 7-5B

# **Key Terms**

bank reconciliation (333) bank statement (330) cash (327) cash equivalents (338) cash short and over account (328) compensating balance (339) control environment (323) electronic funds transfer (EFT) (329) elements of internal control (322) employee fraud (322) internal control (320) petty cash fund (337)

ratio of cash to monthly cash expenses (339) Sarbanes-Oxley Act (320) special-purpose funds (338) voucher (330) voucher system (330)

# **Illustrative Problem**

The bank statement for Urethane Company for June 30, 2015, indicates a balance of \$9,293.11. All cash receipts are deposited each evening in a night depository, after banking hours. The accounting records indicate the following summary data for cash receipts and payments for June:

Cash balance as of June 1	\$ 3,943.50
Total cash receipts for June	28,971.60
Total amount of checks issued in June	28,388.85

Comparing the bank statement and the accompanying canceled checks and memos with the records reveals the following reconciling items:

- a. The bank had collected for Urethane Company \$1,030 on a note left for collection. The face amount of the note was \$1,000.
- b. A deposit of \$1,852.21, representing receipts of June 30, had been made too late to appear on the bank statement.
- c. Checks outstanding totaled \$5,265.27.
- d. A check drawn for \$139 had been incorrectly charged by the bank as \$157.
- e. A check for \$370 returned with the statement had been recorded in the company's records as \$730. The check was for the payment of an obligation to Avery Equipment Company for the purchase of office supplies on account.
- f. Bank service charges for June amounted to \$18.20.

- 1. Prepare a bank reconciliation for June.
- 2. Journalize the entries that should be made by Urethane Company.

### Solution

1.

Urethane Company Bank Reconciliation June 30, 2015					
Cash balance according to bank statement	\$1,852.21	\$ 9,293.11			
instead of \$139	18.00	1,870.21 \$11,163.32			
Deduct: Outstanding checks		5,265.27 \$ 5,898.05			
Cash balance according to company's records		\$ 4,526.25*			
including \$30 interest	\$1,030.00				
Error in recording check	360.00	1,390.00 \$ 5,916.25			
Deduct: Bank service charges		18.20 \$ 5,898.05			
*\$3,943.50 + \$28,971.60 - \$28,388.85					

2.

June	30	Cash Notes Receivable Interest Revenue Accounts Payable—Avery Equipment Company	1,390.00	1,000.00 30.00 360.00	
	30	Miscellaneous Administrative Expense Cash	18.20	18.20	

# **Discussion Questions**

- 1. (a) Name and describe the five elements of internal control. (b) Is any one element of internal control more important than another?
- 2. Why should the employee who handles cash receipts not have the responsibility for maintaining the accounts receivable records? Explain.
- 3. The ticket seller at a movie theater doubles as a ticket taker for a few minutes each day while the ticket taker is on a break. Which control procedure of a business's system of internal control is violated in this situation?
- 4. Why should the responsibility for maintaining the accounting records be separated from the responsibility for operations? Explain.
- 5. Assume that Brooke Miles, accounts payable clerk for West Coast Design Inc., stole \$48,350 by paying fictitious invoices for goods that were never received. The clerk set up accounts in the names of the fictitious companies and cashed the checks at a local bank. Describe a control procedure that would have prevented or detected the fraud.

- 6. Before a voucher for the purchase of merchandise is approved for payment, supporting documents should be compared to verify the accuracy of the liability. Give an example of supporting documents for the purchase of merchandise.
- 7. The balance of Cash is likely to differ from the bank statement balance. What two factors are likely to be responsible for the difference?
- 8. What is the purpose of preparing a bank reconciliation?
- 9. Knott Inc. has a petty cash fund of \$750. (a) Since the petty cash fund is only \$750, should Knott Inc. implement controls over petty cash? (b) What controls, if any, could be used for the petty cash fund?
- 10. (a) How are cash equivalents reported in the financial statements? (b) What are some examples of cash equivalents?

# **Practice Exercises**



### PE 7-1A Internal control elements

OBJ. 2

Identify each of the following as relating to (a) the control environment, (b) control procedures, or (c) information and communication:

- 1. Organizational structure
- 2. Report of company's conformity with environmental laws and regulations
- 3. Proofs and security measures

### **EE 7-1** *p. 327*

### PE 7-1B Internal control elements

OBJ. 2

Identify each of the following as relating to (a) the control environment, (b) control procedures, or (c) monitoring:

- 1. Hiring of external auditors to review the adequacy of controls
- 2. Personnel policies
- 3. Safeguarding inventory in a locked warehouse



### PE 7-2A Items on company's bank statement

**OBJ. 4** 



1. Bank correction of an error from recording a \$6,200 deposit as \$2,600

Appears on the

Memo

- 2. EFT payment
- 3. Note collected for company
- 4. Service charge

Using the following format, indicate whether each item would appear as a debit or credit memo on the bank statement and whether the item would increase or decrease the balance of the company's account:

> **Bank Statement as** a Debit or Credit

Item No.

Increases or Decreases the Balance of the Company's **Bank Account** 



### **EE 7-2** *p. 332*

### PE 7-2B Items on company's bank statement

OBJ. 4



The following items may appear on a bank statement:

- 1. Bank correction of an error from posting another customer's check (disbursement) to the company's account
- 2. EFT deposit
- 3. Loan proceeds
- 4. NSF check

Using the following format, indicate whether each item would appear as a debit or credit memo on the bank statement and whether the item would increase or decrease the balance of the company's account:

	Appears on the
	Bank Statement as
	a Debit or Credit
tem No.	Memo

Increases or Decreases the Balance of the Company's Bank Account

### **EE 7-3** *p. 336*

### PE 7-3A Bank reconciliation

OBJ. 5

The following data were gathered to use in reconciling the bank account of Eves Company:

Balance per bank	\$9,350
Balance per company records	8,510
Bank service charges	35
Deposit in transit	2,350
NSF check	1,875
Outstanding checks	5,100

- a. What is the adjusted balance on the bank reconciliation?
- b. Journalize any necessary entries for Eves Company based on the bank reconciliation.

### **EE 7-3** p. 336

### PE 7-3B Bank reconciliation

OBJ. 5

The following data were gathered to use in reconciling the bank account of Conway Company:

Balance per bank	\$23,900
Balance per company records	8,700
Bank service charges	50
Deposit in transit	5,500
Note collected by bank with \$450 interest	9,450
Outstanding checks	11,300

- a. What is the adjusted balance on the bank reconciliation?
- b. Journalize any necessary entries for Conway Company based on the bank reconciliation.

### **EE 7-4** *p. 338*

### PE 7-4A Petty cash fund

OBJ. 6



Prepare journal entries for each of the following:

- a. Issued a check to establish a petty cash fund of \$750.
- b. The amount of cash in the petty cash fund is \$115. Issued a check to replenish the fund, based on the following summary of petty cash receipts: repair expense, \$515 and miscellaneous selling expense, \$88. Record any missing funds in the cash short and over account.

### **EE 7-4** *p. 338*

### PE 7-4B Petty cash fund

OBJ. 6



Prepare journal entries for each of the following:

- a. Issued a check to establish a petty cash fund of \$900.
- b. The amount of cash in the petty cash fund is \$115. Issued a check to replenish the fund, based on the following summary of petty cash receipts: store supplies, \$550 and miscellaneous selling expense, \$200. Record any missing funds in the cash short and over account.

### **EE 7-5** *p. 340*

### PE 7-5A Ratio of cash to monthly cash expenses

**OBJ. 8** 





Financial data for Otto Company follows:

For Year Ended December 31, 2016 Cash on December 31, 2016 \$ 69,350 Cash flow from operations (114,000)

- a. Compute the ratio of cash to monthly cash expenses.
- b. Interpret the results computed in (a).

### **EE 7-5** *p. 340*

**OBJ. 8** 





PE 7-5B Ratio of cash to monthly cash expenses

Financial data for Bonita Company follows:

	For Year Ended	
	December 31, 2016	
Cash on December 31, 2016	\$ 187,180	
Cash flow from operations	(458,400)	

- a. Compute the ratio of cash to monthly cash expenses.
- b. Interpret the results computed in (a).

### Exercises

### EX 7-1 Sarbanes-Oxley internal control report

Internet Project

Using Wikipedia (www.wikipedia.com), look up the entry for Sarbanes-Oxley Act. Look over the table of contents and find the section that describes Section 404.

What does Section 404 require of management's internal control report?

### EX 7-2 Internal controls

OBJ. 2, 3

Faith Cassen has recently been hired as the manager of Gibraltar Coffee Shop. Gibraltar Coffee Shop is a national chain of franchised coffee shops. During her first month as store manager, Faith encountered the following internal control situations:

- a. Faith caught an employee putting a case of 1,000 single-serving tea bags in his car. Not wanting to create a scene, Faith smiled and said, "I don't think you're putting those tea bags on the right shelf. Don't they belong inside the coffee shop?" The employee returned the tea bags to the stockroom.
- b. Gibraltar Coffee Shop has one cash register. Prior to Faith's joining the coffee shop, each employee working on a shift would take a customer order, accept payment, and then prepare the order. Faith made one employee on each shift responsible for taking orders and accepting the customer's payment. Other employees prepare the orders.
- c. Because only one employee uses the cash register, that employee is responsible for counting the cash at the end of the shift and verifying that the cash in the drawer matches the amount of cash sales recorded by the cash register. Faith expects each cashier to balance the drawer to the penny every time—no exceptions.

State whether you agree or disagree with Faith's method of handling each situation and explain your answer.

### EX 7-3 Internal controls

OBJ. 2, 3

Ramona's Clothing is a retail store specializing in women's clothing. The store has established a liberal return policy for the holiday season in order to encourage gift purchases. Any item purchased during November and December may be returned through January 31, with a receipt, for cash or exchange. If the customer does not have a receipt, cash will still be refunded for any item under \$75. If the item is more than \$75, a check is mailed to the customer.

Whenever an item is returned, a store clerk completes a return slip, which the customer signs. The return slip is placed in a special box. The store manager visits the return counter approximately once every two hours to authorize the return slips. Clerks are instructed to place the returned merchandise on the proper rack on the selling floor as soon as possible. This year, returns at Ramona's Clothing have reached an all-time high. There are a large number of returns under \$75 without receipts.

- a. How can sales clerks employed at Ramona's Clothing use the store's return policy to steal money from the cash register?
- b. What internal control weaknesses do you see in the return policy that make cash thefts easier?
- c. Would issuing a store credit in place of a cash refund for all merchandise returned without a receipt reduce the possibility of theft? List some advantages and disadvantages of issuing a store credit in place of a cash refund.
- d. Assume that Ramona's Clothing is committed to the current policy of issuing cash refunds without a receipt. What changes could be made in the store's procedures regarding customer refunds in order to improve internal control?

### EX 7-4 Internal controls for bank lending

OBJ. 2, 3

Pacific Bank provides loans to businesses in the community through its Commercial Lending Department. Small loans (less than \$100,000) may be approved by an individual loan officer, while larger loans (greater than \$100,000) must be approved by a board of loan officers. Once a loan is approved, the funds are made available to the loan applicant under agreed-upon terms. Pacific Bank has instituted a policy whereby its president has the individual authority to approve loans up to \$5,000,000. The president believes that this policy will allow flexibility to approve loans to valued clients much quicker than under the previous policy.

As an internal auditor of Pacific Bank, how would you respond to this change in policy?

### EX 7-5 Internal controls

OBJ. 2, 3

One of the largest losses in history from unauthorized securities trading involved a securities trader for the French bank, Societe Generale. The trader was able to circumvent internal controls and create more than \$7 billion in trading losses in six months. The trader apparently escaped detection by using knowledge of the bank's internal control systems learned from a previous back-office monitoring job. Much of this monitoring involved the use of software to monitor trades. In addition, traders were usually kept to tight trading limits. Apparently, these controls failed in this case.

What general weaknesses in Societe Generale's internal controls contributed to the occurrence and size of the losses?

### EX 7-6 Internal controls

OBJ. 2, 3

An employee of JHT Holdings, Inc., a trucking company, was responsible for resolving roadway accident claims under \$25,000. The employee created fake accident claims and wrote settlement checks of between \$5,000 and \$25,000 to friends or acquaintances acting as phony "victims." One friend recruited subordinates at his place of work to cash some of the checks. Beyond this, the JHT employee also recruited lawyers, whom he paid to represent both the trucking company and the fake victims in the bogus accident settlements. When the lawyers cashed the checks, they allegedly split the money with the corrupt JHT employee. This fraud went undetected for two years.

Why would it take so long to discover such a fraud?

### EX 7-7 Internal controls

OBJ. 2, 3

All-Around Sound Co. discovered a fraud whereby one of its front office administrative employees used company funds to purchase goods, such as computers, digital cameras, and other electronic items for her own use. The fraud was discovered when employees noticed an increase in delivery frequency from vendors and the use of unusual vendors. After some investigation, it was discovered that the employee would alter the description or change the quantity on an invoice in order to explain the cost on the bill.

What general internal control weaknesses contributed to this fraud?







### EX 7-8 Financial statement fraud

**OBJ. 2, 3** 

A former chairman, CFO, and controller of **Donnkenny**, Inc., an apparel company that makes sportswear for Pierre Cardin and Victoria Jones, pleaded guilty to financial statement fraud. These managers used false journal entries to record fictitious sales, hid inventory in public warehouses so that it could be recorded as "sold," and required sales orders to be backdated so that the sale could be moved back to an earlier period. The combined effect of these actions caused \$25 million out of \$40 million in quarterly sales to be phony.

- a. Why might control procedures listed in this chapter be insufficient in stopping this type of fraud?
- b. How could this type of fraud be stopped?

### EX 7-9 Internal control of cash receipts

OBJ. 2, 3

The procedures used for over-the-counter receipts are as follows. At the close of each day's business, the sales clerks count the cash in their respective cash drawers, after which they determine the amount recorded by the cash register and prepare the memo cash form, noting any discrepancies. An employee from the cashier's office counts the cash, compares the total with the memo, and takes the cash to the cashier's office.

- Indicate the weak link in internal control.
- b. How can the weakness be corrected?

### **EX 7-10** Internal control of cash receipts

OBJ. 2, 3

Sergio Flores works at the drive-through window of Big & Bad Burgers. Occasionally, when a drive-through customer orders, Sergio fills the order and pockets the customer's money. He does not ring up the order on the cash register.

Identify the internal control weaknesses that exist at Big & Bad Burgers, and discuss what can be done to prevent this theft.

### **EX 7-11** Internal control of cash receipts

**OBJ. 2, 3** 

The mailroom employees send all remittances and remittance advices to the cashier. The cashier deposits the cash in the bank and forwards the remittance advices and duplicate deposit slips to the Accounting Department.

- a. Indicate the weak link in internal control in the handling of cash receipts.
- b. How can the weakness be corrected?

### EX 7-12 Entry for cash sales; cash short

**OBJ. 2, 3** 

The actual cash received from cash sales was \$33,854 and the amount indicated by the cash register total was \$33,866. Journalize the entry to record the cash receipts and cash sales.

### EX 7-13 Entry for cash sales; cash over

OBJ. 2, 3

The actual cash received from cash sales was \$51,175 and the amount indicated by the cash register total was \$50,997. Journalize the entry to record the cash receipts and cash sales.

### EX 7-14 Internal control of cash payments

OBJ. 2. 3

Abbe Co. is a small merchandising company with a manual accounting system. An investigation revealed that in spite of a sufficient bank balance, a significant amount of available cash discounts had been lost because of failure to make timely payments. In addition, it was discovered that the invoices for several purchases had been paid twice.

Outline procedures for the payment of vendors' invoices so that the possibili-

Outline procedures for the payment of vendors' invoices so that the possibilities of losing available cash discounts and of paying an invoice a second time will be minimized.





### EX 7-15 Internal control of cash payments

OBJ. 2, 3

Paragon Tech Company, a communications equipment manufacturer, recently fell victim to a fraud scheme developed by one of its employees. To understand the scheme, it is necessary to review Paragon Tech's procedures for the purchase of services.

The purchasing agent is responsible for ordering services (such as repairs to a photocopy machine or office cleaning) after receiving a service requisition from an authorized manager. However, because no tangible goods are delivered, a receiving report is not prepared. When the Accounting Department receives an invoice billing Paragon Tech for a service call, the accounts payable clerk calls the manager who requested the service in order to verify that it was performed.

The fraud scheme involves Mae Jansma, the manager of plant and facilities. Mae arranged for her uncle's company, Radiate Systems, to be placed on Paragon Tech's approved vendor list. Mae did not disclose the family relationship.

On several occasions, Mae would submit a requisition for services to be provided by Radiate Systems. However, the service requested was really not needed, and it was never performed. Radiate Systems would bill Paragon Tech for the service and then split the cash payment with Mae.

Explain what changes should be made to Paragon Tech's procedures for ordering and paying for services in order to prevent such occurrences in the future.

### EX 7-16 Bank reconciliation

OBJ. 5

Identify each of the following reconciling items as: (a) an addition to the cash balance according to the bank statement, (b) a deduction from the cash balance according to the bank statement, (c) an addition to the cash balance according to the company's records, or (d) a deduction from the cash balance according to the company's records. (None of the transactions reported by bank debit and credit memos have been recorded by the company.)

- 1. Bank service charges, \$75.
- 2. Check of a customer returned by bank to company because of insufficient funds, \$880.
- 3. Check for \$275 incorrectly recorded by the company as \$725.
- 4. Check for \$100 incorrectly charged by bank as \$1,000.
- 5. Deposit in transit, \$5,550.
- 6. Outstanding checks, \$10,350.
- 7. Note collected by bank, \$12,720.

### **EX 7-17** Entries based on bank reconciliation

OBJ. 5

Which of the reconciling items listed in Exercise 7-16 require an entry in the company's accounts?

### EX 7-18 Bank reconciliation

OBJ. 5

The following data were accumulated for use in reconciling the bank account of Zek's Co. for May 2016:

- 1. Cash balance according to the company's records at May 31, 2016, \$22,110.
- 2. Cash balance according to the bank statement at May 31, 2016, \$29,650.
- 3. Checks outstanding, \$13,875.
- 4. Deposit in transit, not recorded by bank, \$6,770.
- 5. A check for \$50 in payment of an account was erroneously recorded in the check register as \$500.
- 6. Bank debit memo for service charges, \$15.
- a. Prepare a bank reconciliation, using the format shown in Exhibit 13.
- b. If the balance sheet were prepared for Zek's Co. on May 31, 2016, what amount should be reported for cash?
- c. Must a bank reconciliation always balance (reconcile)?

✓ Adjusted balance: \$22,545









### EX 7-19 Entries for bank reconciliation

OBJ. 5

Using the data presented in Exercise 7-18, journalize the entry or entries that should be made by the company.

### EX 7-20 Entries for note collected by bank

ORI 5

Accompanying a bank statement for Santee Company is a credit memo for \$15,120 representing the principal (\$14,000) and interest (\$1,120) on a note that had been collected by the bank. The company had been notified by the bank at the time of the collection but had made no entries. Journalize the entry that should be made by the company to bring the accounting records up to date.

### **EX 7-21** Bank reconciliation

OBJ. 5

An accounting clerk for Chesner Co. prepared the following bank reconciliation:

# Chesner Co. Bank Reconciliation July 31, 2016

July 31, 2010		
Cash balance according to company's records		\$11,100
Add: Outstanding checks	\$ 3,585	
Error by Chesner Co. in recording Check		
No. 1056 as \$950 instead of \$590	360	
Note for \$12,000 collected by bank, including interest	12,480	16,425
		\$27,525
Deduct: Deposit in transit on July 31	\$ 7,200	
Bank service charges	25	7,225
Cash balance according to bank statement		\$20,300

- a. From the data in this bank reconciliation, prepare a new bank reconciliation for Chesner Co., using the format shown in the illustrative problem.
- b. If a balance sheet were prepared for Chesner Co. on July 31, 2016, what amount should be reported for cash?

### EX 7-22 Bank reconciliation

OBJ. 5

Identify the errors in the following bank reconciliation:

# Poway Co. Bank Reconciliation

For the Month Ended June 30, 2016			
Cash balance according to bank statement			\$16,185
Add outstanding checks:			
No. 1067		\$ 575	
1106		470	
1110		1,050	
1113		910	3,005
			\$19,190
Deduct deposit of June 30, not recorded by bank			6,600
Adjusted balance			\$12,590
Cash balance according to company's records			\$ 8,985
Add: Proceeds of note collected by bank:			
Principal	\$6,000		
Interest	300	\$6,300	
Service charges		15	6,315
			\$15,300
Deduct: Check returned because of insufficient funds		\$ 890	
Error in recording June 17 deposit of \$7,150 as \$1,750		5,400	6,290
Adjusted balance			\$ 9,010

✓ Corrected adjusted balance: \$19,780



### **EX 7-23** Using bank reconciliation to determine cash receipts stolen

OBJ. 2, 3, 5

Alaska Impressions Co. records all cash receipts on the basis of its cash register tapes. Alaska Impressions Co. discovered during October 2016 that one of its sales clerks had stolen an undetermined amount of cash receipts by taking the daily deposits to the bank. The following data have been gathered for October:

Cash in bank according to the general ledger	\$11,680
Cash according to the October 31, 2016, bank statement	13,275
Outstanding checks as of October 31, 2016	3,670
Bank service charge for October	40
Note receivable, including interest collected by bank in October	2,100

No deposits were in transit on October 31.

- a. Determine the amount of cash receipts stolen by the sales clerk.
- b. What accounting controls would have prevented or detected this theft?



### EX 7-24 Petty cash fund entries

OBJ. 6

Journalize the entries to record the following:

- a. Check No. 245-13 is issued to establish a petty cash fund of \$1,100.
- b. The amount of cash in the petty cash fund is now \$115. Check No. 271-13 is issued to replenish the fund, based on the following summary of petty cash receipts: office supplies, \$614; miscellaneous selling expense, \$200; miscellaneous administrative expense, \$145. (Because the amount of the check to replenish the fund plus the balance in the fund do not equal \$1,100, record the discrepancy in the cash short and over account.)



### EX 7-25 Variation in cash flows

OBJ. 7

Mattel, Inc., designs, manufactures, and markets toy products worldwide. Mattel's toys include Barbie™ fashion dolls and accessories, Hot Wheels™, and Fisher-Price brands. For a recent year, Mattel reported the following net cash flows from operating activities (in thousands):

First quarter ending March 30	\$ 171,506
Second quarter ending June 29	(232,557)
Third quarter ending September 29	(40,109)
Fourth quarter ending December 30	986,778

Explain why Mattel reported negative net cash flows from operating activities during the second and third quarters and a large positive cash flow for the fourth quarter, with overall net positive cash flow for the year.



### EX 7-26 Cash to monthly cash expenses ratio

During 2016, El Dorado Inc. has monthly cash expenses of \$168,500. On December 31, 2016, the cash balance is \$1,415,400.

- a. Compute the ratio of cash to monthly cash expenses.
- b. Based on (a), what are the implications for El Dorado Inc.?



# EX 7-27 Cash to monthly cash expenses ratio

Capstone Turbine Corporation produces and sells turbine generators for such applications as charging electric, hybrid vehicles. Capstone Turbine reported the following financial data for a recent year (in thousands):

\$(21,438)

49.952



- Net cash flows from operating activities Cash and cash equivalents
- a. Determine the monthly cash expenses. Round to one decimal place.
- b. Determine the ratio of cash to monthly cash expenses. Round to one decimal place.
- Based on your analysis, do you believe that Capstone Turbine will remain in business?





ME HOW





**OBJ. 8** 

Amicus Therapeutics, Inc., is a biopharmaceutical company that develops drugs for the treatment of various diseases, including Parkinson's disease. Amicus Therapeutics reported the following financial data (in thousands) for three recent years:

	For Years Ended December 31			
	Year 3	Year 2	Year 1	
Cash and cash equivalents	\$ 25,668	\$29,572	\$19,339	
Net cash flows from operations	(49,422)	(13,983)	(43,371)	

- a. Determine the monthly cash expenses for Year 3, Year 2, and Year 1. Round to one decimal place.
- b. Determine the ratio of cash to monthly cash expenses for Year 3, Year 2, and Year 1 as of December 31. Round to one decimal place.
- c. Based on (a) and (b), comment on Amicus Therapeutics' ratio of cash to monthly operating expenses for Year 3, Year 2, and Year 1.

# **Problems: Series A**

### PR 7-1A Evaluating internal control of cash

**OBJ. 2, 3** 

The following procedures were recently installed by Raspberry Creek Company:

- a. After necessary approvals have been obtained for the payment of a voucher, the treasurer signs and mails the check. The treasurer then stamps the voucher and supporting documentation as paid and returns the voucher and supporting documentation to the accounts payable clerk for filing.
- b. The accounts payable clerk prepares a voucher for each disbursement. The voucher along with the supporting documentation is forwarded to the treasurer's office for approval.
- c. Along with petty cash expense receipts for postage, office supplies, etc., several post-dated employee checks are in the petty cash fund.
- d. At the end of the day, cash register clerks are required to use their own funds to make up any cash shortages in their registers.
- e. At the end of each day, all cash receipts are placed in the bank's night depository.
- f. At the end of each day, an accounting clerk compares the duplicate copy of the daily cash deposit slip with the deposit receipt obtained from the bank.
- g. All mail is opened by the mail clerk, who forwards all cash remittances to the cashier. The cashier prepares a listing of the cash receipts and forwards a copy of the list to the accounts receivable clerk for recording in the accounts.
- h. The bank reconciliation is prepared by the cashier, who works under the supervision of the treasurer.

### **Instructions**

Indicate whether each of the procedures of internal control over cash represents (1) a strength or (2) a weakness. For each weakness, indicate why it exists.

### PR 7-2A Transactions for petty cash, cash short and over

ORL 3.6

Cactus Restoration Company completed the following selected transactions during May 2016:

- Oct. 1. Established a petty cash fund of \$750.
  - 12. The cash sales for the day, according to the cash register records, totaled \$12,440 The actual cash received from cash sales was \$12,465.
  - 31. Petty cash on hand was \$157. Replenished the petty cash fund for the following disbursements, each evidenced by a petty cash receipt:





- Oct. 3. Store supplies, \$390.
  - 7. Express charges on merchandise sold, \$35 (Delivery Expense).
  - 9. Office supplies, \$16.
  - 13. Office supplies, \$22.
  - 19. Postage stamps, \$12 (Office Supplies).
  - 21. Repair to office file cabinet lock, \$15 (Miscellaneous Administrative Expense).
  - 22. Postage due on special delivery letter, \$27 (Miscellaneous Administrative Expense).
  - 24. Express charges on merchandise sold, \$55 (Delivery Expense).
  - 30. Office supplies, \$6.
- Oct. 31. The cash sales for the day, according to the cash register records, totaled \$18,820. The actual cash received from cash sales was \$18,780.
  - 31. Decreased the petty cash fund by \$100.

Journalize the transactions.

### PR 7-3A Bank reconciliation and entries

OBJ. 5

The cash account for Capstone Medical Co. at November 30, 2016, indicated a balance of \$89,620. The bank statement indicated a balance of \$128,660 on November 30, 2016. Comparing the bank statement and the accompanying canceled checks and memos with the records revealed the following reconciling items:

- a. Checks outstanding totaled \$32,700.
- b. A deposit of \$18,550, representing receipts of November 30, had been made too late to appear on the bank statement.
- c. The bank collected \$26,750 on a \$25,000 note, including interest of \$1,750.
- d. A check for \$1,500 returned with the statement had been incorrectly recorded by Capstone Medical Co. as \$150. The check was for the payment of an obligation to ABC Supply Co. for a purchase on account.
- e. A check drawn for \$490 had been erroneously charged by the bank as \$940.
- f. Bank service charges for November amounted to \$60.

### **Instructions**

- 1. Prepare a bank reconciliation.
- 2. Journalize the necessary entries. The accounts have not been closed.
- 3. If a balance sheet were prepared for Capstone Medical Co. on November 30, 2016, what amount should be reported as cash?

### PR 7-4A Bank reconciliation and entries

OBJ. 5

The cash account for Brentwood Bike Co. at May 1, 2016, indicated a balance of \$34,250. During May, the total cash deposited was \$140,300, and checks written totaled \$138,880. The bank statement indicated a balance of \$43,525 on May 31. Comparing the bank statement, the canceled checks, and the accompanying memos with the records revealed the following reconciling items:

- a. Checks outstanding totaled \$6,440.
- b. A deposit of \$1,850 representing receipts of May 31, had been made too late to appear on the bank statement.
- c. The bank had collected for Brentwood Bike Co. \$5,250 on a note left for collection. The face of the note was \$5,000.
- d. A check for \$390 returned with the statement had been incorrectly charged by the bank as \$930.

(Continued)

✓ 1. Adjusted balance: \$114,960



General Ledger



ME HOW

✓ 1. Adjusted balance: \$39,475



General Ledger



- e. A check for \$210 returned with the statement had been recorded by Brentwood Bike Co. as \$120. The check was for the payment of an obligation to Adkins Co. on account.
- f. Bank service charges for May amounted to \$30.
- g. A check for \$1,325 from Jennings Co. was returned by the bank due to insufficient funds.

- 1. Prepare a bank reconciliation as of May 31.
- 2. Journalize the necessary entries. The accounts have not been closed.
- 3. If a balance sheet were prepared for Brentwood Bike Co. on May 31, 2016, what amount should be reported as cash?

### PR 7-5A Bank reconciliation and entries

OBJ. 5

✓ 1. Adjusted balance: \$13,216



Beeler Furniture Company deposits all cash receipts each Wednesday and Friday in a night depository, after banking hours. The data required to reconcile the bank statement as of June 30 have been taken from various documents and records and are reproduced as follows. The sources of the data are printed in capital letters. All checks were written for payments on account.

### **CASH ACCOUNT:**

Balance as of June 1 \$9,317.40
CASH RECEIPTS FOR MONTH OF JUNE \$9,223.76
DUPLICATE DEPOSIT TICKETS:

Date and amount of each deposit in June:

Date	Amount	Date	Amount	Date	Amount
June 1	\$1,080.50	June 10	\$ 996.61	June 22	\$ 897.34
3	854.17	15	882.95	24	947.21
8	840.50	17	1,606.74	30	1,117.74

### CHECKS WRITTEN:

Number and amount of each check issued in June:

Check No.	Amount	Check No.	Amount	Check No.	Amount
740	\$237.50	747	Void	754	\$ 449.75
741	495.15	748	\$450.90	755	272.75
742	501.90	749	640.13	756	113.95
743	761.30	750	276.77	757	407.95
744	506.88	751	299.37	758	259.60
745	117.25	752	537.01	759	901.50
746	298.66	753	380.95	760	486.39
Total amount of	checks issued in Ju	ne			\$8,395.66

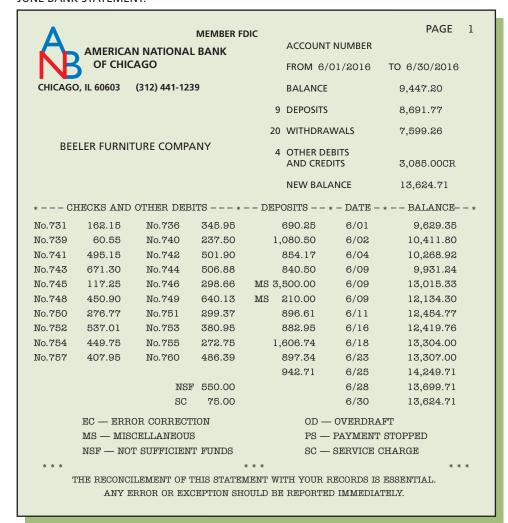
BANK RECONCILIATION FOR PRECEDING MONTH:

### Beeler Furniture Company Bank Reconciliation May 31, 2016

Cash balance according to bank statement		\$ 9,447.20
Add deposit for May 31, not recorded by bank		690.25
		\$10,137.45
Deduct outstanding checks:		
No. 731	\$162.15	
736	345.95	
738	251.40	
739	60.55	820.05
Adjusted balance		\$ 9,317.40
Cash balance according to company's records		\$ 9,352.50
Deduct service charges		35.10
Adjusted balance		\$ 9.317.40

- 1. Prepare a bank reconciliation as of June 30. If errors in recording deposits or checks are discovered, assume that the errors were made by the company. Assume that all deposits are from cash sales. All checks are written to satisfy accounts payable.
- 2. Journalize the necessary entries. The accounts have not been closed.
- 3. What is the amount of Cash that should appear on the balance sheet as of June 30?
- 4. Assume that a canceled check for \$390 has been incorrectly recorded by the bank as \$930. Briefly explain how the error would be included in a bank reconciliation and how it should be corrected.

### JUNE BANK STATEMENT:



# **Problems: Series B**

### PR 7-1B Evaluating internal control of cash

OBJ. 2, 3

The following procedures were recently installed by The China Shop:

- a. All sales are rung up on the cash register, and a receipt is given to the customer. All sales are recorded on a record locked inside the cash register.
- b. Each cashier is assigned a separate cash register drawer to which no other cashier has access.
- c. At the end of a shift, each cashier counts the cash in his or her cash register, unlocks the cash register record, and compares the amount of cash with the amount on the record to determine cash shortages and overages.

(Continued)

- d. Checks received through the mail are given daily to the accounts receivable clerk for recording collections on account and for depositing in the bank.
- e. Vouchers and all supporting documents are perforated with a PAID designation after being paid by the treasurer.
- f. Disbursements are made from the petty cash fund only after a petty cash receipt has been completed and signed by the payee.
- g. The bank reconciliation is prepared by the cashier.

Indicate whether each of the procedures of internal control over cash represents (1) a strength or (2) a weakness. For each weakness, indicate why it exists.

### PR 7-2B Transactions for petty cash, cash short and over

**OBJ. 3, 6** 

Cedar Springs Company completed the following selected transactions during June 2016:

- June 1. Established a petty cash fund of \$1,000.
  - 12. The cash sales for the day, according to the cash register records, totaled \$9,440. The actual cash received from cash sales was \$9,506.
  - 30. Petty cash on hand was \$46. Replenished the petty cash fund for the following disbursements, each evidenced by a petty cash receipt:
    - June 2. Store supplies, \$375.
      - 10. Express charges on merchandise purchased, \$105 (Merchandise Inventory).
      - 14. Office supplies, \$85.
      - 15. Office supplies, \$90.
      - 18. Postage stamps, \$33 (Office Supplies).
      - 20. Repair to fax, \$100 (Miscellaneous Administrative Expense).
      - 21. Repair to office door lock, \$25 (Miscellaneous Administrative Expense).
      - 22. Postage due on special delivery letter, \$9 (Miscellaneous Administrative Expense).
      - 28. Express charges on merchandise purchased, \$110 (Merchandise Inventory).
  - 30. The cash sales for the day, according to the cash register records, totaled \$13,390. The actual cash received from cash sales was \$13,350.
  - 30. Increased the petty cash fund by \$200.

### Instructions

Journalize the transactions.

### PR 7-3B Bank reconciliation and entries

OBJ. 5

The cash account for Stone Systems at July 31, 2016, indicated a balance of \$17,750. The bank statement indicated a balance of \$33,650 on July 31, 2016. Comparing the bank statement and the accompanying canceled checks and memos with the records reveals the following reconciling items:

- a. Checks outstanding totaled \$17,865.
- b. A deposit of \$9,150, representing receipts of July 31, had been made too late to appear on the bank statement.
- c. The bank had collected \$6,095 on a note left for collection. The face of the note was \$5,750.
- d. A check for \$390 returned with the statement had been incorrectly recorded by Stone Systems as \$930. The check was for the payment of an obligation to Holland Co. for the purchase of office supplies on account.
- e. A check drawn for \$1,810 had been incorrectly charged by the bank as \$1,180.
- f. Bank service charges for July amounted to \$80.

### **Instructions**

- 1. Prepare a bank reconciliation.
- 2. Journalize the necessary entries. The accounts have not been closed.
- 3. If a balance sheet were prepared for Stone Systems on July 31, 2014, what amount should be reported as cash?





✓ 1. Adjusted balance: \$24,305



General Ledger



### ✓ 1. Adjusted balance: \$78,535





### PR 7-4B Bank reconciliation and entries

OBJ. 5

The cash account for Collegiate Sports Co. on November 1, 2016, indicated a balance of \$81,145. During November, the total cash deposited was \$293,150, and checks written totaled \$307,360. The bank statement indicated a balance of \$112,675 on November 30, 2016. Comparing the bank statement, the canceled checks, and the accompanying memos with the records revealed the following reconciling items:

- a. Checks outstanding totaled \$41,840.
- b. A deposit of \$12,200, representing receipts of November 30, had been made too late to appear on the bank statement.
- c. A check for \$7,250 had been incorrectly charged by the bank as \$2,750.
- d. A check for \$760 returned with the statement had been recorded by Collegiate Sports Co. as \$7,600. The check was for the payment of an obligation to Ramirez Co. on account.
- e. The bank had collected for Collegiate Sports Co. \$7,385 on a note left for collection. The face of the note was \$7,000.
- f. Bank service charges for November amounted to \$125.
- g. A check for \$2,500 from Hallen Academy was returned by the bank because of insufficient funds.

### Instructions

1. Prepare a bank reconciliation as of November 30.

BANK RECONCILIATION FOR PRECEDING MONTH (DATED JUNE 30):

- 2. Journalize the necessary entries. The accounts have not been closed.
- 3. If a balance sheet were prepared for Collegiate Sports Co. on November 30, 2014, what amount should be reported as cash?

### PR 7-5B Bank reconciliation and entries

OBJ. 5

¢210 10

Sunshine Interiors deposits all cash receipts each Wednesday and Friday in a night depository, after banking hours. The data required to reconcile the bank statement as of July 31 have been taken from various documents and records and are reproduced as follows. The sources of the data are printed in capital letters. All checks were written for payments on account.

### 1. Adjusted balance: \$11,494



### Cash balance according to bank statement..... \$ 9,422.80 Add deposit of June 30, not recorded by bank..... 780.80 \$10,203.60

# Deduct outstanding checks: No 500

110. 300	3310.10	
No. 602	85.50	
No. 612	92.50	
No. 613	137.50	625.60
Adjusted balance		\$ 9,578.00
Cash balance according to company's records		\$ 9,605.70
Deduct service charges		27.70
Adjusted balance		\$ 9,578.00
CASH ACCOUNT:		
Balance as of July 1		\$ 9,578.00

CASH RECEIPTS FOR MONTH OF JULY

**DUPLICATE DEPOSIT TICKETS:** 

Date and amount of each deposit in July:

Date	Amount	Date	Amount	Date	Amount
July 2	\$569.50	July 12	\$580.70	July 23	\$ 713.45
5	701.80	16	600.10	26	601.50
9	819.24	19	701.26	31	1,177.87

(Continued)

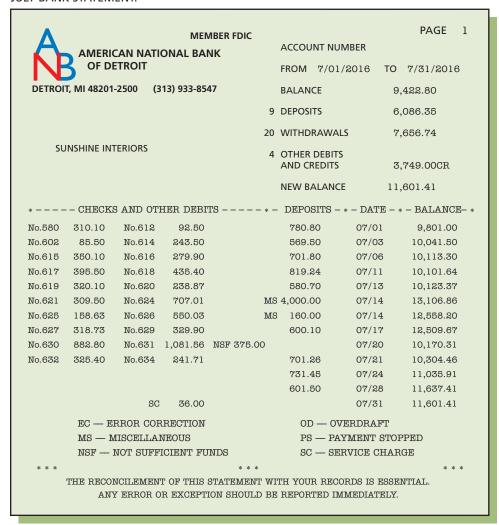
6,465.42

### CHECKS WRITTEN:

Number and amount of each check issued in July:

Check No.	Amount	Check No.	Amount	Check No.	Amount
614	\$243.50	621	\$309.50	628	\$ 837.70
615	350.10	622	Void	629	329.90
616	279.90	623	Void	630	882.80
617	395.50	624	707.01	631	1,081.56
618	435.40	625	158.63	632	325.40
619	320.10	626	550.03	633	310.08
620	238.87	627	381.73	634	241.71
Total amount of	checks issued in Ju	ly			\$8,379.42

### JULY BANK STATEMENT:



### **Instructions**

- 1. Prepare a bank reconciliation as of July 31. If errors in recording deposits or checks are discovered, assume that the errors were made by the company. Assume that all deposits are from cash sales. All checks are written to satisfy accounts payable.
- 2. Journalize the necessary entries. The accounts have not been closed.
- 3. What is the amount of Cash that should appear on the balance sheet as of July 31?
- 4. Assume that a canceled check for \$180 has been incorrectly recorded by the bank as \$1,800. Briefly explain how the error would be included in a bank reconciliation and how it should be corrected.

# **Cases & Projects**



### CP 7-1 Ethics and professional conduct in business

During the preparation of the bank reconciliation for Building Concepts Co., Joel Kimmel, the assistant controller, discovered that Lone Peak National Bank incorrectly recorded a \$3,290 check written by Building Concepts Co. as \$329. Joel has decided not to notify the bank but wait for the bank to detect the error. Joel plans to record the \$2,961 error as Other Income if the bank fails to detect the error within the next three months.

Discuss whether Joel is behaving in a professional manner.

### CP 7-2 Internal controls

The following is an excerpt from a conversation between two sales clerks, Jean Moen and Sara Cheney. Jean and Sara are employed by Turpin Meadows Electronics, a locally owned and operated electronics retail store.

Jean: Did you hear the news?

Sara: What news?

Jean: Neal and Linda were both arrested this morning.

Sara: What? Arrested? You're putting me on!

*Jean*: No, really! The police arrested them first thing this morning. Put them in handcuffs, read them their rights—the whole works. It was unreal!

Sara: What did they do?

*Jean:* Well, apparently they were filling out merchandise refund forms for fictitious customers and then taking the cash. *Sara:* I guess I never thought of that. How did they catch them?

Jean: The store manager noticed that returns were twice that of last year and seemed to be increasing. When he confronted Neal, he became flustered and admitted to taking the cash, apparently more than \$9,000 in just three months. They're going over the last six months' transactions to try to determine how much Linda stole. She apparently started stealing first.

Suggest appropriate control procedures that would have prevented or detected the theft of cash.

### **CP 7-3** Internal controls

The following is an excerpt from a conversation between the store manager of Wholesome Grocery Stores, Kara Dahl, and Lynn Shutes, president of Wholesome Grocery Stores:

Lynn: Kara, I'm concerned about this new scanning system.

Kara: What's the problem?

Lynn: Well, how do we know the clerks are ringing up all the merchandise?

*Kara*: That's one of the strong points about the system. The scanner automatically rings up each item, based on its bar code. We update the prices daily, so we're sure that the sale is rung up for the right price.

*Lynn:* That's not my concern. What keeps a clerk from pretending to scan items and then simply not charging his friends? If his friends were buying 10–15 items, it would be easy for the clerk to pass through several items with his finger over the bar code or just pass the merchandise through the scanner with the wrong side showing. It would look normal for anyone observing. In the old days, we at least could hear the cash register ringing up each sale.

Kara: I see your point.

Suggest ways that Wholesome Grocery Stores could prevent or detect the theft of merchandise as described.



### CP 7-4 Ethics and professional conduct in business

Doris Tidwell and Jo Yost are both cash register clerks for Fuller's Organic Markets. Tom Ward is the store manager for Fuller's Organic Markets. The following is an excerpt of a conversation between Doris and Jo:

Doris: Jo, how long have you been working for Fuller's Organic Markets?

Jo: Almost five years this April. You just started two weeks ago . . . right?

Doris: Yes. Do you mind if I ask you a question?

Jo: No, go ahead.

Doris: What I want to know is, have they always had this rule that if your cash register is short at the end of the day, you have to make up the shortage out of your own pocket?

Jo: Yes, as long as I've been working here.

Doris: Well, it's the pits. Last week I had to pay in almost \$40.

Jo: It's not that big a deal. I just make sure that I'm not short at the end of the day.

Doris: How do you do that?

Jo: I just shortchange a few customers early in the day. There are a few jerks that deserve it anyway. Most of the time, their attention is elsewhere, and they don't think to check their change.

Doris: What happens if you're over at the end of the day?

Jo: Tom lets me keep it as long as it doesn't get to be too large. I've not been short in over a year. I usually clear about \$20 to \$30 extra per day.

Discuss this case from the viewpoint of proper controls and professional behavior.

### CP 7-5 Bank reconciliation and internal control

The records of Parker Company indicate a July 31, 2016 cash balance of \$10,400, which includes undeposited receipts for July 30 and 31. The cash balance on the bank statement as of July 31 is \$10,575. This balance includes a note of \$2,250 plus \$150 interest collected by the bank but not recorded in the journal. Checks outstanding on July 31 were as follows: No. 2670, \$1,050; No. 3679, \$675; No. 3690, \$1,650; No. 5148, \$225; No. 5149, \$750; and No. 5151, \$800.

On July 25, the cashier resigned, effective at the end of the month. Before leaving on July 31, the cashier prepared the following bank reconciliation:

Cash balance per books, July 31		\$10,400
Add outstanding checks:		
No. 5148	\$225	
5149	750	
5151	800	1,675 \$12,075
		\$12,075
Less undeposited receipts		1,500
Cash balance per bank, July 31		\$10,575
Deduct unrecorded note with interest		2,400
True cash, July 31		\$ 8,175

Calculator Tape of Outstanding Checks: 0* 225 +750 +800 +1 675*

Subsequently, the Chief Operating Officer (CEO) of Parker Company discovered that the cashier had stolen an unknown amount of undeposited receipts, leaving only \$1,500 to be deposited on July 31. The CEO, a close family friend, has asked your help in determining the amount that the former cashier has stolen.

- 1. Determine the amount the cashier stole from Parker Company. Show your computations in good form.
- 2. How did the cashier attempt to conceal the theft?
- 3. a. Identify two major weaknesses in internal controls that allowed the cashier to steal the undeposited cash receipts.
  - b. Recommend improvements in internal controls so that similar types of thefts of undeposited cash receipts can be prevented.

#### CP 7-6 Observe internal controls over cash

#### **Group Project**

Select a business in your community and observe its internal controls over cash receipts and cash payments. The business could be a bank or a bookstore, restaurant, department store, or other retailer. In groups of three or four, identify and discuss the similarities and differences in each business's cash internal controls.

#### CP 7-7 Cash to monthly cash expenses ratio





**TearLab Corp.** is a health care company that specializes in developing diagnostic devices for eye disease. TearLab reported the following data (in thousands) for three recent years:

	For Years Ended December 31			
	Year 3	Year 2	Year 1	
Cash and cash equivalents	\$ 2,807	\$ 2,726	\$ 106	
Net cash flows from operations	(5,974)	(4,540)	(4,098)	

- 1. Determine the monthly cash expenses for Year 3, Year 2, and Year 1. Round to one decimal place.
- 2. Determine the ratio of cash to monthly cash expenses as of December 31, for Year 3, Year 2, and Year 1. Round to one decimal place.
- 3. Based on (1) and (2), comment on TearLab's ratio of cash to monthly operating expenses for Year 3, Year 2, and Year 1.



## Receivables

## Oakley, Inc.

The sale and purchase of merchandise involves the exchange of goods for cash. However, the point at which cash actually changes hands varies with the transaction. Consider transactions by **Oakley, Inc.**, a worldwide leader in the design, development, manufacture, and distribution of premium sunglasses, goggles, prescription eyewear, apparel, footwear, and accessories. Not only does the company sell its products through three different company-owned retail chains, but it also has approximately 10,000 independent distributors.

If you were to buy a pair of sunglasses at an Oakley Vault, which is one of the company's retail outlet stores, you would have to pay cash or use a credit card to pay for the glasses be-

fore you left the store. However, Oakley allows its distributors to purchase sunglasses "on account." These sales on account are recorded as receivables due from the distributors.

As an individual, you also might build up a trusted financial history with a local company or department store that would allow you to purchase merchandise on account. Like Oakley's distributors, your purchase on account would be recorded as an account receivable. Such credit transactions facilitate sales and are a significant current asset for many businesses.

This chapter describes common classifications of receivables, illustrates how to account for uncollectible receivables, and demonstrates the reporting of receivables on the balance sheet.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe the common classes of receivables. Classification of Receivables Accounts Receivable Notes Receivable Other Receivables	
Describe the accounting for uncollectible receivables. Uncollectible Receivables	
Describe the direct write-off method of accounting for uncollectible receivables.  Direct Write-Off Method for Uncollectible Accounts	EE 8-1
Describe the allowance method of accounting for uncollectible receivables.  Allowance Method for Uncollectible Accounts  Write-Offs to the Allowance Account  Estimating Uncollectibles	EE 8-2 EE 8-3 EE 8-4
Compare the direct write-off and allowance methods of accounting for uncollectible accound Comparing Direct Write-Off and Allowance Methods	nts.
Describe the accounting for notes receivable. Notes Receivable Characteristics of Notes Receivable Accounting for Notes Receivable	EE 8-5
Describe the reporting of receivables on the balance sheet. Reporting Receivables on the Balance Sheet	
Describe and illustrate the use of accounts receivable turnover and number of days' sales in receivables to evaluate a company's efficiency in collecting its receivables.  Financial Analysis and Interpretation: Accounts Receivable Turnover and Number of Days' Sales in Receivables	EE 8-6
At a Glai	<b>Rece 8</b> Page 383



## **Classification of Receivables**

The receivables that result from sales on account are normally accounts receivable or notes receivable. The term **receivables** includes all money claims against other entities, including people, companies, and other organizations. Receivables are usually a significant portion of the total current assets.

#### **Accounts Receivable**

The most common transaction creating a receivable is selling merchandise or services on account (on credit). The receivable is recorded as a debit to Accounts Receivable. Such **accounts receivable** are normally collected within a short period, such as 30 or 60 days. They are classified on the balance sheet as a current asset.

#### **Notes Receivable**

**Notes receivable** are amounts that customers owe for which a formal, written instrument of credit has been issued. If notes receivable are expected to be collected within a year, they are classified on the balance sheet as a current asset.

Notes are often used for credit periods of more than 60 days. For example, an automobile dealer may require a down payment at the time of sale and accept a note or a series of notes for the remainder. Such notes usually provide for monthly payments.

Notes may also be used to settle a customer's account receivable. Notes and accounts receivable that result from sales transactions are sometimes called *trade receivables*. In this chapter, all notes and accounts receivable are from sales transactions.

A recent

balance sheet of Caterpillar Inc. reported that receivables made up more than 56% of its current assets.

#### **Other Receivables**

Other receivables include interest receivable, taxes receivable, and receivables from officers or employees. Other receivables are normally reported separately on the balance sheet. If they are expected to be collected within one year, they are classified as current assets. If collection is expected beyond one year, they are classified as noncurrent assets and reported under the caption *Investments*.

#### **Uncollectible Receivables**

In prior chapters, the accounting for sales of merchandise or services on account (on credit) was described and illustrated. A major issue that has not yet been discussed is that some customers will not pay their accounts. That is, some accounts receivable will be uncollectible.

Companies may shift the risk of uncollectible receivables to other companies. For example, some retailers do not accept sales on account but will only accept cash or credit cards. Such policies shift the risk to the credit card companies.

Companies may also sell their receivables. This is often the case when a company issues its own credit card. For example, Macy's and JCPenney issue their own credit cards. Selling receivables is called *factoring* the receivables. The buyer of the receivables is called a *factor*. An advantage of factoring is that the company selling its receivables immediately receives cash for operating and other needs. Also, depending on the factoring agreement, some of the risk of uncollectible accounts is shifted to the factor.

Regardless of how careful a company is in granting credit, some credit sales will be uncollectible. The operating expense recorded from uncollectible receivables is called **bad debt expense**, *uncollectible accounts expense*, or *doubtful accounts expense*.

There is no general rule for when an account becomes uncollectible. Some indications that an account may be uncollectible include the following:

- The receivable is past due.
- The customer does not respond to the company's attempts to collect.
- The customer files for bankruptcy.
- The customer closes its business.
- The company cannot locate the customer.

If a customer doesn't pay, a company may turn the account over to a collection agency. After the collection agency attempts to collect payment, any remaining balance in the account is considered worthless.

The two methods of accounting for uncollectible receivables are as follows:

- The direct write-off method records bad debt expense only when an account is determined to be worthless.
- The allowance method records bad debt expense by estimating uncollectible accounts at the end of the accounting period.

The direct write-off method is often used by small companies and companies with few receivables. Generally accepted accounting principles (GAAP), however, require companies with a large amount of receivables to use the allowance method. As a result, most well-known companies such as General Electric, Pepsi, Intel, and FedEx use the allowance method.

## **Direct Write-Off Method for Uncollectible Accounts**

Under the direct write-off method, Bad Debt Expense is not recorded until the customer's account is determined to be worthless. At that time, the customer's account receivable is written off.

¹The direct write-off method is also required for federal income tax purposes.

Describe the accounting for uncollectible receivables.



Adams, Stevens & Bradley, Ltd. is a collection

agency that operates on a contingency basis. That is, its fees are based on what it collects.



To illustrate, assume that a \$4,200 account receivable from D. L. Ross has been determined to be uncollectible. The entry to write off the account is as follows:

May	10	Bad Debt Expense Accounts Receivable—D. L. Ross	4,200	4,200	

An account receivable that has been written off may be collected later. In such cases, the account is reinstated by an entry that reverses the write-off entry. The cash received in payment is then recorded as a receipt on account.

To illustrate, assume that the D. L. Ross account of \$4,200 written off on May 10 is later collected on November 21. The reinstatement and receipt of cash is recorded as follows:

Nov.	21	Accounts Receivable—D. L. Ross Bad Debt Expense	4,200	4,200	
	21	Cash Accounts Receivable—D. L. Ross	4,200	4,200	

The direct write-off method is used by businesses that sell most of their goods or services for cash or through the acceptance of MasterCard or VISA, which are recorded as cash sales. In such cases, receivables are a small part of the current assets and any bad debt expense is small. Examples of such businesses are a restaurant, a convenience store, and a small retail store.

#### Example Exercise 8-1 Direct Write-Off Method



Journalize the following transactions, using the direct write-off method of accounting for uncollectible receivables:

- July 9. Received \$1,200 from Jay Burke and wrote off the remainder owed of \$3,900 as uncollectible.
- Oct. 11. Reinstated the account of Jay Burke and received \$3,900 cash in full payment.

Follow My Example 8-1								
July 9	Cash	1,200						
	Bad Debt Expense	3,900						
	Accounts Receivable—Jay Burke	5,100						
Oct. 11	Accounts Receivable—Jay Burke	3,900						
	Bad Debt Expense	3,900						
11	Cash	3,900						
	Accounts Receivable—Jay Burke	3,900						
•••••		Practice Exercises: PE 8-1A, PE 8-1B						



## **Allowance Method for Uncollectible Accounts**

The allowance method estimates the uncollectible accounts receivable at the end of the accounting period. Based on this estimate, Bad Debt Expense is recorded by an adjusting entry.

To illustrate, assume that **ExTone Company** began operations August 1. As of the end of its accounting period on December 31, 2015, ExTone has an accounts receivable balance of \$200,000. This balance includes some past due accounts. Based

on industry averages, ExTone estimates that \$30,000 of the December 31 accounts receivable will be uncollectible. However, on December 31, ExTone doesn't know which customer accounts will be uncollectible. Thus, specific customer accounts cannot be decreased or credited. Instead, a contra asset account, **Allowance for Doubtful Accounts**, is credited for the estimated bad debts.

Using the \$30,000 estimate, the following adjusting entry is made on December 31:

	²⁰¹⁵ Dec.	31	Bad Debt Expense Allowance for Doubtful Accounts Uncollectible accounts estimate.		30,000	30,000	
--	----------------------	----	-----------------------------------------------------------------------------------	--	--------	--------	--

The preceding adjusting entry affects the income statement and balance sheet. On the income statement, the \$30,000 of Bad Debt Expense will be matched against the related revenues of the period. On the balance sheet, the value of the receivables is reduced to the amount that is expected to be collected or realized. This amount, \$170,000 (\$200,000 – \$30,000), is called the **net realizable value** of the receivables.

After the preceding adjusting entry is recorded, Accounts Receivable still has a debit balance of \$200,000. This balance is the total amount owed by customers on account on December 31 as supported by the accounts receivable subsidiary ledger. The accounts receivable contra account, Allowance for Doubtful Accounts, has a credit balance of \$30,000.

#### Note:

The adjusting entry reduces receivables to their net realizable value and matches the uncollectible expense with revenues.

## Integrity, Objectivity, and Ethics in Business



#### **SELLER BEWARE**

A company in financial distress will still try to purchase goods and services on account. In these cases, rather than "buyer beware," it is more like "seller beware." Sellers must be careful in advancing credit to such companies

because trade creditors have low priority for cash payments in the event of bankruptcy. To help suppliers, third-party services specialize in evaluating court actions and payment decisions of financially distressed companies.

#### Write-Offs to the Allowance Account

When a customer's account is identified as uncollectible, it is written off against the allowance account. This requires the company to remove the specific accounts receivable and an equal amount from the allowance account.

To illustrate, on January 21, 2016, John Parker's account of \$6,000 with **ExTone Company** is written off as follows:

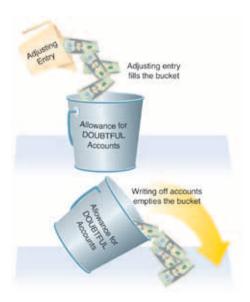
	Jan. 21	Allowance for Doubtful Accounts Accounts Receivable—John Parker		6,000	6,000	
--	---------	--------------------------------------------------------------------	--	-------	-------	--

At the end of a period, Allowance for Doubtful Accounts will normally have a balance. This is because Allowance for Doubtful Accounts is based on an estimate. As a result, the total write-offs to the allowance account during the period will rarely equal the balance of the account at the beginning of the period. The allowance account will have a credit balance at the end of the period if the write-offs during the period are less than the beginning balance. It will have a debit balance if the write-offs exceed the beginning balance.

Exhibit 1 illustrates the allowance method where the adjusting entry increases the Allowance for Doubtful Accounts (fills the bucket) while writing off accounts decreases the Allowance for Doubtful Accounts (empties the bucket).

#### **EXHIBIT 1**

#### The Allowance Method



To illustrate, assume that during 2016 **ExTone Company** writes off \$26,750 of uncollectible accounts, including the \$6,000 account of John Parker recorded on January 21. Allowance for Doubtful Accounts will have a credit balance of \$3,250 (\$30,000 – \$26,750), computed as follows:

#### **ALLOWANCE FOR DOUBTFUL ACCOUNTS**

	ſ			Jan. 1	Balance	30,000
Total accounts	Jan.	21	6,000			
written off \$26,750	Feb.	2	3,900			
	:		:			
			<u> </u>			
	C			Dec. 31	Unadjusted balance	3,250

If ExTone had written off \$32,100 in accounts receivable during 2016, Allowance for Doubtful Accounts would have a debit balance of \$2,100, computed as follows:

#### **ALLOWANCE FOR DOUBTFUL ACCOUNTS**

		<i>c</i>			Jan. 1	Balance	30,000
Tot	tal accounts	Jan.	21	6,000			
wri	itten off \$32,100	Feb.	2	3,900			
		:		÷			
Dec. 31	Unadju	sted ba	lance	2,100			

The allowance account balances (credit balance of \$3,250 and debit balance of \$2,100) in the preceding illustrations are *before* the end-of-period adjusting entry. After the end-of-period adjusting entry is recorded, Allowance for Doubtful Accounts should always have a credit balance.

An account receivable that has been written off against the allowance account may be collected later. Like the direct write-off method, the account is reinstated by an entry that reverses the write-off entry. The cash received in payment is then recorded as a receipt on account.

To illustrate, assume that Nancy Smith's account of \$5,000, which was written off on April 2, is collected later on June 10. **ExTone Company** records the reinstatement and the collection as follows:

June	10	Accounts Receivable—Nancy Smith Allowance for Doubtful Accounts	5,000	5,000	
	10	Cash Accounts Receivable—Nancy Smith	5,000	5,000	

#### **Example Exercise 8-2** Allowance Method



Journalize the following transactions, using the allowance method of accounting for uncollectible receivables:

- July 9. Received \$1,200 from Jay Burke and wrote off the remainder owed of \$3,900 as uncollectible.
- Oct. 11. Reinstated the account of Jay Burke and received \$3,900 cash in full payment.

Follow My Example 8-2							
July 9	Cash	1,200					
	Allowance for Doubtful Accounts	3,900					
	Accounts Receivable—Jay Burke	5,100					
Oct. 11	Accounts Receivable—Jay Burke	3,900					
	Allowance for Doubtful Accounts	3,900					
11	Cash	3,900					
	Accounts Receivable—Jay Burke	3,900					
		Practice Exercises: PF 8-2A, PF 8-2B					

#### **Estimating Uncollectibles**

The allowance method requires an estimate of uncollectible accounts at the end of the period. This estimate is normally based on past experience, industry averages, and forecasts of the future.

The two methods used to estimate uncollectible accounts are as follows:

- · Percent of sales method.
- · Analysis of receivables method.

**Percent of Sales Method** Since accounts receivable are created by credit sales, uncollectible accounts can be estimated as a percent of credit sales. If the portion of credit sales to sales is relatively constant, the percent may be applied to total sales.



## 

#### **ALLOWANCE PERCENTAGES ACROSS COMPANIES**

The percent of the allowance for doubtful accounts to total accounts receivable will vary across companies and industries. For example, the following percentages were computed from recent annual reports:

HCA's higher percentage of allowance for doubtful accounts to total accounts receivable is due in part because Medicare reimbursements are often less than the amounts billed patients.

> Percent of Allowance for **Doubtful Accounts to Total**

Company	Industry	Accounts Receivable
Apple Inc.	Computer and technology products	1.0%
Boeing	Aerospace and airplanes	1.0
Delta Air Lines	Transportation services	2.1
HCA Inc.	Health services	50.9
Sears	Retail	3.9

To illustrate, assume the following data for **ExTone Company** on December 31, 2016, before any adjustments:

Balance of Accounts Receivable \$ 240,000
Balance of Allowance for Doubtful Accounts 3,250 (Cr.)
Total credit sales 3,000,000
Bad debt as a percent of credit sales 34%

Bad Debt Expense of \$22,500 is estimated as follows:

Bad Debt Expense = Credit Sales  $\times$  Bad Debt as a Percent of Credit Sales Bad Debt Expense = \$3,000,000  $\times$   $\frac{3}{4}\%$  = \$22,500

The adjusting entry for uncollectible accounts on December 31, 2016, is as follows:

|--|

After the adjusting entry is posted to the ledger, Bad Debt Expense will have an adjusted balance of \$22,500. Allowance for Doubtful Accounts will have an adjusted balance of \$25,750 (\$3,250 + \$22,500). Both T accounts follow:

#### **BAD DEBT EXPENSE**

Dec. 31	Adjusting entry	22	,500 🗲			
	, , ,					
Dec. 31	Adjusted balanc	te <u>22,</u>	,500			
		ALLOWA	NCE FOR	DOUBTFUL	ACCOUNTS	
		ſ		Jan. 1	Balance	30,000
	Total accounts	Jan. 21	6,000			
	written off \$26,750	Feb. 2	3,900			
		:	:			
				Dec. 31	Unadjusted balance	3,250
				Dec. 31	Adjusting entry	22,500
				Dec. 31	Adjusted balance	25,750

Under the percent of sales method, the amount of the adjusting entry is the amount estimated for Bad Debt Expense. This estimate is credited to whatever the unadjusted balance is for Allowance for Doubtful Accounts.

To illustrate, assume that in the preceding example the unadjusted balance of Allowance for Doubtful Accounts on December 31, 2016, had been a \$2,100 debit balance instead of a \$3,250 credit balance. The adjustment would still have been \$22,500. However, the December 31, 2016, ending adjusted balance of Allowance for Doubtful Accounts would have been \$20,400 (\$22,500 – \$2,100).

#### Note:

The estimate based on sales is added to any balance in Allowance for Doubtful Accounts.

#### Example Exercise 8-3 Percent of Sales Method



At the end of the current year, Accounts Receivable has a balance of \$800,000; Allowance for Doubtful Accounts has a credit balance of \$7,500; and sales for the year total \$3,500,000. Bad debt expense is estimated at ½ of 1% of sales.

Determine (a) the amount of the adjusting entry for uncollectible accounts; (b) the adjusted balances of Accounts Receivable, Allowance for Doubtful Accounts, and Bad Debt Expense; and (c) the net realizable value of accounts receivable.

#### Follow My Example 8-3

Bad Debt Expense.....

25,000 17,500



c. \$775,000 (\$800,000 - \$25,000)

Practice Exercises: PE 8-3A, PE 8-3B

**Analysis of Receivables Method** The analysis of receivables method is based on the assumption that the longer an account receivable is outstanding, the less likely that it will be collected. The analysis of receivables method is applied as follows:

- Step 1. The due date of each account receivable is determined.
- Step 2. The number of days each account is past due is determined. This is the number of days between the due date of the account and the date of the analysis.
- Step 3. Each account is placed in an aged class according to its days past due. Typical aged classes include the following:

Not past due

1-30 days past due

31-60 days past due

61-90 days past due

91-180 days past due

181-365 days past due

Over 365 days past due

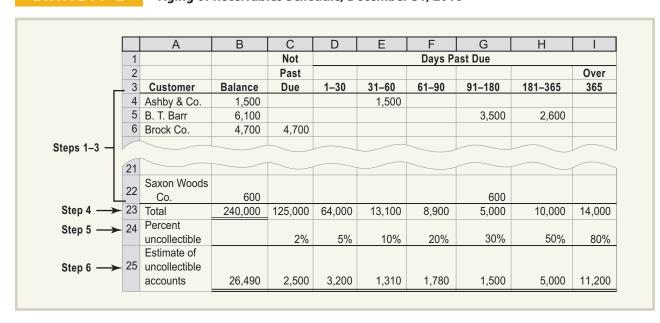
- Step 4. The totals for each aged class are determined.
- Step 5. The total for each aged class is multiplied by an estimated percentage of uncollectible accounts for that class.
- Step 6. The estimated total of uncollectible accounts is determined as the sum of the uncollectible accounts for each aged class.

The preceding steps are summarized in an aging schedule, and this overall process is called **aging the receivables**.

To illustrate, assume that **ExTone Company** uses the analysis of receivables method instead of the percent of sales method. ExTone prepared an aging schedule for its accounts receivable of \$240,000 as of December 31, 2016, as shown in Exhibit 2.

#### **EXHIBIT 2**

#### Aging of Receivables Schedule, December 31, 2016



Assume that ExTone sold merchandise to Saxon Woods Co. on August 29 with terms 2/10, n/30. Thus, the due date (Step 1) of Saxon Woods' account is September 28, computed as follows:

 Credit terms, net
 30 days

 Less: Aug. 29 to Aug. 31
 2 days

 Days in September
 28 days

As of December 31, Saxon Woods' account is 94 days past due (Step 2), computed as follows:

Number of days past due in September	2 days (30 – 28)
Number of days past due in October	31 days
Number of days past due in November	30 days
Number of days past due in December	<u>31</u> days
Total number of days past due	94 days

Exhibit 2 shows that the \$600 account receivable for Saxon Woods Co. was placed in the 91–180 days past due class (Step 3).

The total for each of the aged classes is determined (Step 4). Exhibit 2 shows that \$125,000 of the accounts receivable are not past due, while \$64,000 are 1–30 days past due. ExTone applies a different estimated percentage of uncollectible accounts to the totals of each of the aged classes (Step 5). As shown in Exhibit 2, the percent is 2% for accounts not past due, while the percent is 80% for accounts over 365 days past due.

The sum of the estimated uncollectible accounts for each aged class (Step 6) is the estimated uncollectible accounts on December 31, 2016. This is the desired adjusted balance for Allowance for Doubtful Accounts. For ExTone, this amount is \$26,490, as shown in Exhibit 2.

Comparing the estimate of \$26,490 with the unadjusted balance of the allowance account determines the amount of the adjustment for Bad Debt Expense. For ExTone, the unadjusted balance of the allowance account is a credit balance of \$3,250. The amount to be added to this balance is therefore \$23,240 (\$26,490 - \$3,250). The adjusting entry is as follows:

D	ec.	31	Bad Debt Expense Allowance for Doubtful Accounts Uncollectible accounts estimate (\$26,490 – \$3,250).		23,240	23,240	
---	-----	----	--------------------------------------------------------------------------------------------------------	--	--------	--------	--

After the preceding adjusting entry is posted to the ledger, Bad Debt Expense will have an adjusted balance of \$23,240. Allowance for Doubtful Accounts will have an adjusted balance of \$26,490, and the net realizable value of the receivables is \$213,510 (\$240,000 – \$26,490). Both T accounts follow:

BAD DEBT EXPENSE						
Dec. 31 Dec. 31	Adjusting entry Adjusted balance	23,240 <del>4</del> 23,240				
	AL	LOWANCE FOR DOL	JBTFUL A	CCOUNTS		
			Dec. 31	Unadjusted balance Adjusting entry Adjusted balance	3,250 23,240 26,490	•

Under the analysis of receivables method, the amount of the adjusting entry is the amount that will yield an adjusted balance for Allowance for Doubtful Accounts equal to that estimated by the aging schedule.

To illustrate, if the unadjusted balance of the allowance account had been a debit balance of \$2,100, the amount of the adjustment would have been \$28,590 (\$26,490 + \$2,100). In this case, Bad Debt Expense would have an adjusted balance of \$28,590. However, the adjusted balance of Allowance for Doubtful Accounts would still have been \$26,490. After the adjusting entry is posted, both T accounts follow:

#### **BAD DEBT EXPENSE** Dec. 31 28,590 Adjusting entry Dec. 31 Adjusted balance 28,590 ALLOWANCE FOR DOUBTFUL ACCOUNTS Dec. 31 Unadjusted balance 2,100 Dec. 31 Adjusting entry 28,590 26,490 Dec. 31 Adjusted balance

#### Note:

The estimate based on receivables is compared to the balance in the allowance account to determine the amount of the adjusting entry.

#### **Example Exercise 8-4** Analysis of Receivables Method

OBJ 4

At the end of the current year, Accounts Receivable has a balance of \$800,000; Allowance for Doubtful Accounts has a credit balance of \$7,500; and sales for the year total \$3,500,000. Using the aging method, the balance of Allowance for Doubtful Accounts is estimated as \$30,000.

Determine (a) the amount of the adjusting entry for uncollectible accounts; (b) the adjusted balances of Accounts Receivable, Allowance for Doubtful Accounts, and Bad Debt Expense; and (c) the net realizable value of accounts receivable.

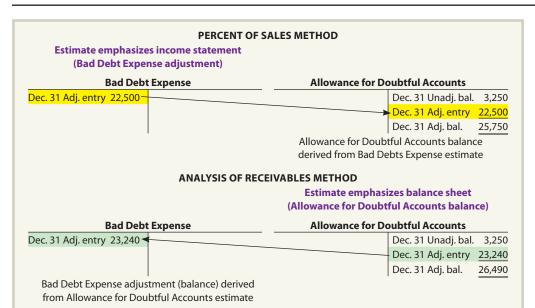
Follow My Example 8-4	
a. \$22,500 (\$30,000 – \$7,500)	
	Adjusted Balance
b. Accounts Receivable	\$800,000
Allowance for Doubtful Accounts	30,000
Bad Debt Expense	22,500
c. \$770,000 (\$800,000 – \$30,000)	
	Practice Exercises: PE 8-4A, PE 8-4B

**Comparing Estimation Methods** Both the percent of sales and analysis of receivables methods estimate uncollectible accounts. However, each method has a slightly different focus and financial statement emphasis.

Under the percent of sales method, Bad Debt Expense is the focus of the estimation process. The percent of sales method places more emphasis on matching revenues and expenses and, thus, emphasizes the income statement. That is, the amount of the adjusting entry is based on the estimate of Bad Debt Expense for the period. Allowance for Doubtful Accounts is then credited for this amount.

Under the analysis of receivables method, Allowance for Doubtful Accounts is the focus of the estimation process. The analysis of receivables method places more emphasis on the net realizable value of the receivables and, thus, emphasizes the balance sheet. That is, the amount of the adjusting entry is the amount that will yield an adjusted balance for Allowance for Doubtful Accounts equal to that estimated by the aging schedule. Bad Debt Expense is then debited for this amount.

Exhibit 3 summarizes these differences between the percent of sales and the analysis of receivables methods. Exhibit 3 also shows the results of the **ExTone Company** illustration for the percent of sales and analysis of receivables methods. The amounts shown in Exhibit 3 assume an unadjusted credit balance of \$3,250 for Allowance for

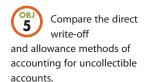


#### **EXHIBIT 3**

Difference Between Estimation Methods



Doubtful Accounts. While the methods normally yield different amounts for any one period, over several periods the amounts should be similar.



# **Comparing Direct Write-Off and Allowance Methods**

Journal entries for the direct write-off and allowance methods are illustrated and compared in this section. As a basis for illustration, the following transactions, taken from the records of Hobbs Company for the year ending December 31, 2015, are used:

- Mar. 1. Wrote off account of C. York, \$3,650.
- Apr. 12. Received \$2,250 as partial payment on the \$5,500 account of Cary Bradshaw. Wrote off the remaining balance as uncollectible.
- June 22. Received the \$3,650 from C. York, which had been written off on March 1. Reinstated the account and recorded the cash receipt.
- Sept. 7. Wrote off the following accounts as uncollectible (record as one journal entry):

Jason Bigg	\$1,100	Stanford Noonan	\$1,360
Steve Bradey	2,220	Aiden Wyman	990
Samantha Neelev	775		

Dec. 31. Hobbs Company uses the percent of credit sales method of estimating uncollectible expenses. Based on past history and industry averages, 1.25% of credit sales are expected to be uncollectible. Hobbs recorded \$3,400,000 of credit sales during 2015.

Exhibit 4 illustrates the journal entries for Hobbs using the direct write-off and allowance methods. Using the direct write-off method, there is no adjusting entry on December 31 for uncollectible accounts. In contrast, the allowance method records an adjusting entry for estimated uncollectible accounts of \$42,500.

#### EXHIBIT 4

#### **Comparing Direct Write-Off and Allowance Methods**

	ı		I	l			
		Direct Write-Off Method			Allowance Method		
Mar.	1	Bad Debt Expense Accounts Receivable—C. York	3,650	3,650	Allowance for Doubtful Accounts Accounts Receivable—C. York	3,650	3,650
Apr.	12	Cash	2,250		Cash	2,250	
		Bad Debt Expense	3,250		Allowance for Doubtful Accounts	3,250	
		Accounts Receivable—Cary Bradshaw		5,500	Accounts Receivable—Cary Bradshaw		5,500
June	22	Accounts Receivable—C. York	3,650		Accounts Receivable—C. York	3,650	
		Bad Debt Expense		3,650	Allowance for Doubtful Accounts		3,650
	22	Cash	3,650		Cash	3,650	
		Accounts Receivable—C. York		3,650	Accounts Receivable—C. York		3,650
Sept.	7	Bad Debt Expense	6,445		Allowance for Doubtful Accounts	6,445	
		Accounts Receivable—Jason Bigg		1,100	Accounts Receivable—Jason Bigg		1,100
		Accounts Receivable—Steve Bradey Accounts Receivable—Samantha		2,220	Accounts Receivable—Steve Bradey Accounts Receivable—Samantha		2,220
		Neeley		775	Neeley		775
		Accounts Receivable—Stanford			Accounts Receivable—Stanford		
		Noonan		1,360	Noonan		1,360
		Accounts Receivable—Aiden Wyman		990	Accounts Receivable—Aiden Wyman		990
Dec.	31	No Entry			Bad Debt Expense	42,500	
					Allowance for Doubtful Accounts Uncollectible accounts estimate		42,500
					$($3,400,000 \times 0.0125 = $42,500).$		

The primary differences between the direct write-off and allowance methods are summarized in Exhibit 5.

<b>Direct Write-Off Method</b>	Allowance Method
When the specific customer	Using estimate based on
accounts are determined to be	(1) a percent of sales or
uncollectible.	(2) an analysis of receivables.
No allowance account is used.	The allowance account is used.
Small companies and companies with few receivables.	Large companies and those with a large amount of receivables.
	When the specific customer accounts are determined to be uncollectible. No allowance account is used. Small companies and companies

#### **EXHIBIT 5**

Direct Write-Off and Allowance Methods

#### **Notes Receivable**

A note has some advantages over an account receivable. By signing a note, the debtor recognizes the debt and agrees to pay it according to its terms. Thus, a note is a stronger legal claim.



#### **Characteristics of Notes Receivable**

A promissory note is a written promise to pay the face amount, usually with interest, on demand or at a date in the future.² Characteristics of a promissory note are as follows:

- 1. The *maker* is the party making the promise to pay.
- 2. The payee is the party to whom the note is payable.
- 3. The face amount is the amount for which the note is written on its face.
- 4. The issuance date is the date a note is issued.
- 5. The due date or maturity date is the date the note is to be paid.
- 6. The term of a note is the amount of time between the issuance and due dates.
- 7. The *interest rate* is that rate of interest that must be paid on the face amount for the term of the note.

Exhibit 6 illustrates a promissory note. The maker of the note is Selig Company, and the payee is Pearland Company. The face value of the note is \$2,000, the interest rate is 10%, and the issuance date is March 16, 2015. The term of the note is 90 days, which results in a due date of June 14, 2015, computed as follows and shown in Exhibit 7:

Days in March	31 days
Minus issuance date of note	<u>16</u>
Days remaining in March	15 days
Add days in April	30
Add days in May	31
Add days in June (due date of June 14)	<u>14</u>
Term of note	<u>90</u> days

The interest on a note is computed as follows:

Interest = Face Amount  $\times$  Interest Rate  $\times$  (Term  $\div$  360 days)

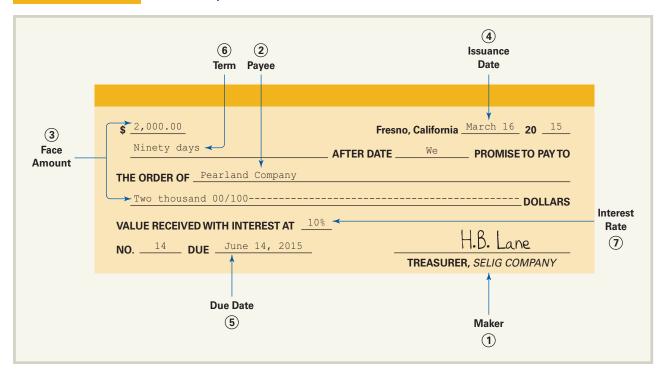
The interest rate is stated on an annual (yearly) basis, while the term is expressed as days. Thus, the interest on the note in Exhibit 6 is computed as follows:

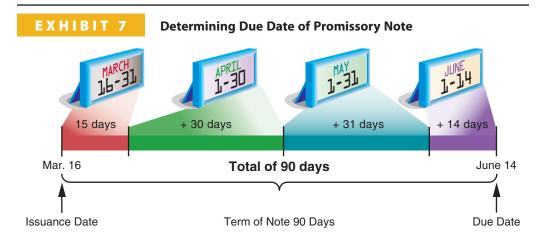
Interest = 
$$$2,000 \times 10\% \times (90 \div 360) = $50$$

To simplify, 360 days per year will be used. In practice, companies such as banks and mortgage companies use the exact number of days in a year, 365.

² You may see references to non-interest-bearing notes. Such notes are not widely used and carry an assumed or implicit interest rate.

#### **EXHIBIT 6** Promissory Note





The **maturity value** is the amount that must be paid at the due date of the note, which is the sum of the face amount and the interest. The maturity value of the note in Exhibit 6 is \$2,050 (\$2,000 + \$50).

## **Accounting for Notes Receivable**

A promissory note may be received by a company from a customer to replace an account receivable. In such cases, the promissory note is recorded as a note receivable.³

To illustrate, assume that a company accepts a 30-day, 12% note dated November 21, 2016, in settlement of the account of W. A. Bunn Co., which is past due and has a balance of \$6,000. The company records the receipt of the note as follows:

Nov. 21 Notes Receivable—W. A. Bunn Co. 6,000 Accounts Receivable—W. A. Bunn Co.	6,000
----------------------------------------------------------------------------------	-------

³ The accounting for notes payable is described and illustrated in Chapter 12.

At the due date, the company records the receipt of \$6,060 (\$6,000 face amount plus \$60 interest) as follows:

Dec.	21	Cash Notes Receivable—W. A. Bunn Co.	6,060	6,000	
		Interest Revenue [\$6,060 = \$6,000 + (\$6,000 $\times$ 12% $\times$ 30 $\div$ 360)].		60	

If the maker of a note fails to pay the note on the due date, the note is a **dishonored note receivable**. A company that holds a dishonored note transfers the face amount of the note plus any interest due back to an accounts receivable account. For example, assume that the \$6,000, 30-day, 12% note received from W. A. Bunn Co. and recorded on November 21 is dishonored. The company holding the note transfers the note and interest back to the customer's account as follows:

	Dec.	21	Accounts Receivable—W. A. Bunn Co. Notes Receivable—W. A. Bunn Co. Interest Revenue	6,060	6,000 60	

The company has earned the interest of \$60, even though the note is dishonored. If the account receivable is uncollectible, the company will write off \$6,060 against Allowance for Doubtful Accounts.

A company receiving a note should record an adjusting entry for any accrued interest at the end of the period. For example, assume that Crawford Company issues a \$4,000, 90-day, 12% note dated December 1, 2016, to settle its account receivable. If the accounting period ends on December 31, the company receiving the note would record the following entries:

2016 Dec	. 1	Notes Receivable—Crawford Company Accounts Receivable—Crawford Company	4,00	0 4,000	
	31	Interest Receivable Interest Revenue Accrued interest $(\$4,000 \times 12\% \times 30 \div 360).$	4	0 40	
2017 Mar	. 1	Cash Notes Receivable—Crawford Company Interest Receivable Interest Revenue Total interest of \$120 $($4,000 \times 12\% \times 90 \div 360)$ .	4,12	0 4,000 40 80	

The interest revenue account is closed at the end of each accounting period. The amount of interest revenue is normally reported in the Other Income section of the income statement.

#### **Example Exercise 8-5** Note Receivable



Same Day Surgery Center received a 120-day, 6% note for \$40,000, dated March 14, from a patient on account.

- a. Determine the due date of the note.
- b. Determine the maturity value of the note.
- c. Journalize the entry to record the receipt of the payment of the note at maturity.

(Continued)

#### Follow My Example 8-5 a. The due date of the note is July 12, determined as follows: March 17 days (31 - 14) April 30 days May 31 days June 30 days July 12 days Total 120 days b. $$40,800 [$40,000 + ($40,000 \times 6\% \times 120 \div 360)]$ c. July 12 Cash ..... 40,800 Notes Receivable..... 40,000 800 Interest Revenue .....

Describe the reporting of receivables on the balance sheet.

## **Reporting Receivables on the Balance Sheet**

All receivables that are expected to be realized in cash within a year are reported in the Current assets section of the balance sheet. Current assets are normally reported in the order of their liquidity, beginning with cash and cash equivalents.

Practice Exercises: PE 8-5A, PE 8-5B

The balance sheet presentation for receivables for Mornin' Joe follows:



Mornin' Joe Balance Sheet December 31, 2016		
Assets		
Current assets:		
Cash and cash equivalents		\$235,000
Trading investments (at cost)	\$420,000	
Plus valuation allowance for trading investments	45,000	465,000
Accounts receivable	\$305,000	
Less allowance for doubtful accounts	12,300	292,700

In Mornin' Joe's financial statements, the allowance for doubtful accounts is subtracted from accounts receivable. Some companies report receivables at their net realizable value with a note showing the amount of the allowance.

Other disclosures related to receivables are reported either on the face of the financial statements or in the financial statement notes. Such disclosures include the market (fair) value of the receivables. In addition, if unusual credit risks exist within the receivables, the nature of the risks are disclosed. For example, if the majority of the receivables are due from one customer or are due from customers located in one area of the country or one industry, these facts are disclosed.⁴

# Describe and illustrate the use of accounts receivable turnover and number of days' sales in receivables to evaluate a company's efficiency in collecting its receivables.



## Financial Analysis and Interpretation: Accounts Receivable Turnover and Number of Days' Sales in Receivables

Two financial measures that are especially useful in evaluating efficiency in collecting receivables are the following:

- the accounts receivable turnover
- the number of days' sales in receivables

⁴ FASB Accounting Standards Codification, Section 210-10-50.

The accounts receivable turnover measures how frequently during the year the accounts receivable are being converted to cash. For example, with credit terms of n/30, the accounts receivable should turn over about 12 times per year.

The accounts receivable turnover is computed as follows:5

The average accounts receivable can be determined by using monthly data or by simply adding the beginning and ending accounts receivable balances and dividing by two. For example, using the following financial data (in millions) for FedEx, the Year 2 and Year 1 accounts receivable turnover is 8.2 in Year 2 and 8.0 in Year 1, computed as follows:

	Year 2	Year 1
Sales	\$42,680	\$39,304
Accounts receivable:		
Beginning of year	5,191	4,692
End of year	5,237	5,191
Average accounts receivable:*		
(\$5,191 + \$5,237) ÷ 2	5,214.0	
(\$4,692 + \$5,191) ÷ 2		4,941.5
Accounts receivable turnover:*		
\$42,680 ÷ \$5,214	8.2	
\$39,304 ÷ \$4,941.5		8.0
* Rounded to one decimal place.		

The grapher of developing and

The **number of days' sales in receivables** is an estimate of the length of time the accounts receivable have been outstanding. With credit terms of n/30, the number of days' sales in receivables should be about 30 days. It is computed as follows:

$$\mbox{Number of Days' Sales in Receivables} = \frac{\mbox{Average Accounts Receivable}}{\mbox{Average Daily Sales}}$$

Average daily sales are determined by dividing sales by 365 days.⁶ For example, using the preceding data for FedEx, the number of days' sales in receivables is 44.6 and 45.9 for Year 2 and Year 1, computed as follows:

	rear 2	rear i
Average daily sales:*		
\$42,680 ÷ 365	116.9	
\$39,304 ÷ 365		107.7
Number of days' sales in receivables:*		
\$5,214.0 ÷ 116.9	44.6	
\$4,941.5 ÷ 107.7		45.9
* Rounded to one decimal place.		

The number of days' sales in receivables confirms that FedEx's efficiency in collecting accounts receivable increased from Year 1 to Year 2. Generally, the efficiency in collecting accounts receivable has improved when the accounts receivable turnover increases or the number of days' sales in receivables decreases.

## Example Exercise 8-6 Accounts Receivable Turnover and Number of Days' Sales in Receivables



Financial statement data for years ending December 31 for Osterman Company follows:

	2016	2015
Sales	\$4,284,000	\$3,040,000
Accounts receivable:		
Beginning of year	550,000	400,000
End of year	640,000	550,000

⁵ If known, credit sales can be used in the numerator. However, because credit sales are not normally disclosed to external users, most analysts use sales in the numerator.

(Continued)

⁶ We use 365 days for all computations involving real world companies and data. We do this to highlight differences among companies and because computations using real world data normally require rounding.

#### Follow My Example 8-6

- a. Determine the accounts receivable turnover for 2016 and 2015.
- b. Determine the number of days' sales in receivables for 2016 and 2015. Use 365 days and round to one decimal place.
- c. Does the change in accounts receivable turnover and the number of days' sales in receivable from 2015 to 2016 indicate a favorable or an unfavorable trend?
- a. Accounts receivable turnover:

	2016	2015
Average accounts receivable:		
(\$550,000 + \$640,000) ÷ 2	\$595,000	
(\$400,000 + \$550,000) ÷ 2		\$475,000
Accounts receivable turnover:		
\$4,284,000 ÷ \$595,000	7.2	
\$3,040,000 ÷ \$475,000		6.4

b. Number of days' sales in receivables:

	2016	2015
Average daily sales:		
\$4,284,000 ÷ 365 days	\$11,737.0	
\$3,040,000 ÷ 365 days		\$8,328.8
Number of days' sales in receivables:		
\$595,000 ÷ \$11,737.0	50.7 days	
\$475,000 ÷ \$8,328.8		57.0 days

c. The increase in the accounts receivable turnover from 6.4 to 7.2 and the decrease in the number of days' sales in receivables from 57.0 days to 50.7 days indicate favorable trends in the efficiency of collecting accounts receivable.

Practice Exercises: PE 8-6A, PE 8-6B



## Business **Connection**

#### **DELTA AIR LINES**

Delta Air Lines is a major air carrier that services cities throughout the United States and the world. In its operations, Delta generates accounts receivable as reported in the following note to its financial statements:

Our accounts receivable are generated largely from the sale of passenger airline tickets and cargo transportation services. The majority of these sales are processed through major credit card companies, resulting in accounts receivable. . . .

We also have receivables from the sale of mileage credits under our SkyMiles Program to participating airlines and nonairline businesses such as credit card companies, hotels, and car

Source: Delta Air Lines, Inc., Form 10-K For the Fiscal Year Ended December 31, 2012.

rental agencies. The credit risk associated with our receivables is minimal.

In a recent, balance sheet, Delta reported the following accounts receivable (in millions):

Dec. 31, Dec. 31, Year 2 Year 1 **Current Assets:** 

Accounts receivable, net of an allowance for uncollectible accounts of \$36 at December 31 (Year 2) and \$33 at December 31 (Year 1)

\$1,693 \$1,563

# At a Glance 8



#### Describe the common classes of receivables.

**Key Points** *Receivables* includes all money claims against other entities. Receivables are normally classified as accounts receivable, notes receivable, or other receivables.

Learning Outcomes	Example Exercises	Practice Exercises
• Define the term <i>receivables</i> .		
• List some common classifications of receivables.		



#### Describe the accounting for uncollectible receivables.

**Key Points** The operating expense recorded from uncollectible receivables is called *bad debt expense*. The two methods of accounting for uncollectible receivables are the direct write-off method and the allowance method.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe how a company may shift the risk of uncollectible receivables to other companies.</li> </ul>		
<ul> <li>List factors that indicate an account receivable is uncollectible.</li> </ul>		
<ul> <li>Describe two methods of accounting for uncollectible accounts receivable.</li> </ul>		



#### Describe the direct write-off method of accounting for uncollectible receivables.

**Key Points** Under the direct write-off method, the entry to write off an account debits Bad Debt Expense and credits Accounts Receivable. Neither an allowance account nor an adjusting entry is needed at the end of the period.

<ul><li>Prepare journal entries to write off an account, using the direct write-off method.</li></ul>	Example Exercises EE8-1	Practice Exercises PE8-1A, 8-1B
• Prepare journal entries for the reinstatement and collection of an account previously written off.	EE8-1	PE8-1A, 8-1B



#### Describe the allowance method of accounting for uncollectible receivables.

**Key Points** Under the allowance method, an adjusting entry is made for uncollectible accounts. When an account is determined to be uncollectible, it is written off against the allowance account. The allowance account is a contra asset account that normally has a credit balance after the adjusting entry has been posted.

The estimate of uncollectibles may be based on a percent of sales or an analysis of receivables. Exhibit 3 compares and contrasts these two methods.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Prepare journal entries to write off an account, using the allowance method.</li> </ul>	EE8-2	PE8-2A, 8-2B
<ul> <li>Prepare journal entries for the reinstatement and collection of an account previously written off.</li> </ul>	EE8-2	PE8-2A, 8-2B
• Determine the adjustment, bad debt expense, and net realizable value of accounts receivable, using the percent of sales method.	EE8-3	PE8-3A, 8-3B
<ul> <li>Determine the adjustment, bad debt expense, and net realizable value of accounts receivable, using the analysis of receivables method.</li> </ul>	EE8-4	PE8-4A, 8-4B



#### Compare the direct write-off and allowance methods of accounting for uncollectible accounts.

**Key Points** Exhibit 4 illustrates the differences between the direct write-off and allowance methods of accounting for uncollectible accounts.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the differences in accounting for uncollectible accounts under the direct write-off and allowance methods.</li> </ul>		
<ul> <li>Record journal entries, using the direct write-off and allowance methods.</li> </ul>		



#### Describe the accounting for notes receivable.

**Key Points** A note received to settle an account receivable is recorded as a debit to Notes Receivable and a credit to Accounts Receivable. When a note is paid at maturity, Cash is debited, Notes Receivable is credited, and Interest Revenue is credited. If the maker of a note fails to pay, the dishonored note is recorded by debiting an account receivable for the amount due from the maker of the note.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe the characteristics of a note receivable.		
<ul> <li>Determine the due date and maturity value of a note receivable.</li> </ul>	EE8-5	PE8-5A, 8-5B
• Prepare journal entries for the receipt of the payment of a note receivable.	EE8-5	PE8-5A, 8-5B
• Prepare a journal entry for the dishonored note receivable.		



#### Describe the reporting of receivables on the balance sheet.

**Key Points** All receivables that are expected to be realized in cash within a year are reported in the Current Assets section of the balance sheet. In addition to the allowance for doubtful accounts, additional receivable disclosures include the market (fair) value and unusual credit risks.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe how receivables are reported in the Current Assets section of the balance sheet.</li> </ul>		
<ul> <li>Describe the disclosures related to receivables that should be reported in the financial statements.</li> </ul>		



Describe and illustrate the use of accounts receivable turnover and number of days' sales in receivables to evaluate a company's efficiency in collecting its receivables.

**Key Points** Two financial measures that are especially useful in evaluating efficiency in collecting receivables are (1) the accounts receivable turnover and (2) the number of days' sales in receivables. Generally, the efficiency in collecting accounts receivable has improved when the accounts receivable turnover increases or there is a decrease in the number of days' sales in receivables.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe two measures of the efficiency of managing receivables.		
• Compute and interpret the accounts receivable turnover and the number of days' sales in receivables.	EE8-6	PE8-6A, 8-6B

## **Key Terms**

accounts receivable (366) accounts receivable turnover (381) aging the receivables (373) Allowance for Doubtful Accounts (369) allowance method (367) bad debt expense (367) direct write-off method (367) dishonored note receivable (379) maturity value (378) net realizable value (369) notes receivable (366) number of days' sales in receivables (381) receivables (366)

## **Illustrative Problem**

Ditzler Company, a construction supply company, uses the allowance method of accounting for uncollectible accounts receivable. Selected transactions completed by Ditzler Company are as follows:

- Feb. 1. Sold merchandise on account to Ames Co., \$8,000. The cost of the merchandise sold was \$4,500.
- Mar. 15. Accepted a 60-day, 12% note for \$8,000 from Ames Co. on account.
- Apr. 9. Wrote off a \$2,500 account from Dorset Co. as uncollectible.
  - 21. Loaned \$7,500 cash to Jill Klein, receiving a 90-day, 14% note.
- May 14. Received the interest due from Ames Co. and a new 90-day, 14% note as a renewal of the loan. (Record both the debit and the credit to the notes receivable account.)
- June 13. Reinstated the account of Dorset Co., written off on April 9, and received \$2,500 in full payment.
- July 20. Jill Klein dishonored her note.
- Aug. 12. Received from Ames Co. the amount due on its note of May 14.
  - 19. Received from Jill Klein the amount owed on the dishonored note, plus interest for 30 days at 15%, computed on the maturity value of the note.
- Dec. 16. Accepted a 60-day, 12% note for \$12,000 from Global Company on account.
  - 31. It is estimated that 3% of the credit sales of \$1,375,000 for the year ended December 31 will be uncollectible.

#### **Instructions**

- 1. Journalize the transactions.
- 2. Journalize the adjusting entry to record the accrued interest on December 31 on the Global Company note.

#### **Solution**

1.

Feb.	1	Accounts Receivable—Ames Co. Sales	8,000.00	8,000.00
	1	Cost of Merchandise Sold Merchandise Inventory	4,500.00	4,500.00
Mar.	15	Notes Receivable—Ames Co. Accounts Receivable—Ames Co.	8,000.00	8,000.00
Apr.	9	Allowance for Doubtful Accounts Accounts Receivable—Dorset Co.	2,500.00	2,500.00
	21	Notes Receivable—Jill Klein Cash	7,500.00	7,500.00
May	14	Notes Receivable—Ames Co. Cash Notes Receivable—Ames Co. Interest Revenue	8,000.00 160.00	8,000.00 160.00
June	13	Accounts Receivable—Dorset Co. Allowance for Doubtful Accounts	2,500.00	2,500.00
	13	Cash Accounts Receivable—Dorset Co.	2,500.00	2,500.00
July	20	Accounts Receivable—Jill Klein Notes Receivable—Jill Klein Interest Revenue	7,762.50	7,500.00 262.50
Aug.	12	Cash Notes Receivable—Ames Co. Interest Revenue	8,280.00	8,000.00 280.00
	19	Cash Accounts Receivable—Jill Klein Interest Revenue (\$7,762.50 × 15% × 30 ÷ 360).	7,859.53	7,762.50 97.03
Dec.	16	Notes Receivable—Global Company Accounts Receivable—Global Company	12,000.00	12,000.00
	31	Bad Debt Expense Allowance for Doubtful Accounts Uncollectible accounts estimate (\$1,375,000 × 3%).	41,250.00	41,250.00

2.

Dec.	31	Interest Receivable Interest Revenue	60.00	60.00
		Accrued interest (\$12,000 $\times$ 12% $\times$ 15 $\div$ 360).		

## **Discussion Questions**

- 1. What are the three classifications of receivables?
- 2. Dan's Hardware is a small hardware store in the rural township of Twin Bridges. It rarely extends credit to its customers in the form of an account receivable. The few customers who are allowed to carry accounts receivable are long-time residents of Twin Bridges with a history of doing business at Dan's Hardware. What method of accounting for uncollectible receivables should Dan's Hardware use? Why?
- What kind of an account (asset, liability, etc.) is Allowance for Doubtful Accounts, and is its normal balance a debit or a credit?
- 4. After the accounts are adjusted and closed at the end of the fiscal year, Accounts Receivable has a balance of \$673,400, and Allowance for Doubtful Accounts has a balance of \$11,900. Describe how the accounts receivable and the allowance for doubtful accounts are reported on the balance sheet.
- 5. A firm has consistently adjusted its allowance account at the end of the fiscal year by adding a fixed percent of the period's sales on account. After seven years, the balance in Allowance for Doubtful

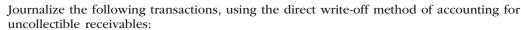
- Accounts has become very large in relationship to the balance in Accounts Receivable. Give two possible explanations.
- 6. Which of the two methods of estimating uncollectibles provides for the most accurate estimate of the current net realizable value of the receivables?
- 7. Neptune Company issued a note receivable to Sailfish Company. (a) Who is the payee? (b) What is the title of the account used by Sailfish Company in recording the note?
- 8. If a note provides for payment of principal of \$85,000 and interest at the rate of 6%, will the interest amount to \$5,100? Explain.
- 9. The maker of a \$240,000, 6%, 90-day note receivable failed to pay the note on the due date of November 30. What accounts should be debited and credited by the payee to record the dishonored note receivable?
- 10. The note receivable dishonored in Discussion Question 9 is paid on December 30 by the maker, plus interest for 30 days at 9%. What entry should be made to record the receipt of the payment?

## **Practice Exercises**

**EE 8-1** *p. 368* 

#### PE 8-1A Direct write-off method

OBJ. 3



- Received \$1,200 from Melissa Crone and wrote off the remainder owed of \$4,000 as uncollectible.
- Oct. 9. Reinstated the account of Melissa Crone and received \$4,000 cash in full payment.

**EE 8-1** *p. 368* 

#### PE 8-1B Direct write-off method

OBJ. 3

Journalize the following transactions, using the direct write-off method of accounting for uncollectible receivables:

- Oct. 2. Received \$600 from Rachel Elpel and wrote off the remainder owed of \$1,350 as uncollectible.
- Dec. 20. Reinstated the account of Rachel Elpel and received \$1,350 cash in full payment.



#### EE 8-2 p. 371 PE 8-2A Allowance method

**OBJ. 4** 



Journalize the following transactions, using the allowance method of accounting for uncollectible receivables:

- June 2. Received \$1,200 from Melissa Crone and wrote off the remainder owed of \$4,000 as uncollectible.
- Oct. 9. Reinstated the account of Melissa Crone and received \$4,000 cash in full payment.

#### EE 8-2 p. 371 PE 8-2B Allowance method

OBJ. 4



Journalize the following transactions, using the allowance method of accounting for uncollectible receivables:

- Oct. 2. Received \$600 from Rachel Elpel and wrote off the remainder owed of \$1,350 as uncollectible.
- Dec. 20. Reinstated the account of Rachel Elpel and received \$1,350 cash in full payment.

#### EE 8-3 p. 372 PE 8-3A Percent of sales method

OBJ. 4



At the end of the current year, Accounts Receivable has a balance of \$1,975,000; Allowance for Doubtful Accounts has a credit balance of \$19,670; and sales for the year total \$28,550,000. Bad debt expense is estimated at 3/4 of 1% of sales.

Determine (a) the amount of the adjusting entry for uncollectible accounts; (b) the adjusted balances of Accounts Receivable, Allowance for Doubtful Accounts, and Bad Debt Expense; and (c) the net realizable value of accounts receivable.

#### EE 8-3 p. 372 PE 8-3B Percent of sales method

OBJ. 4



At the end of the current year, Accounts Receivable has a balance of \$3,460,000; Allowance for Doubtful Accounts has a debit balance of \$12,500; and sales for the year total \$46,300,000. Bad debt expense is estimated at ½ of 1% of sales.

Determine (a) the amount of the adjusting entry for uncollectible accounts; (b) the adjusted balances of Accounts Receivable, Allowance for Doubtful Accounts, and Bad Debt Expense; and (c) the net realizable value of accounts receivable.

#### EE 8-4 p. 375 PE 8-4A Analysis of receivables method

OBJ. 4



At the end of the current year, Accounts Receivable has a balance of \$1,975,000; Allowance for Doubtful Accounts has a credit balance of \$19,670; and sales for the year total \$28,550,000. Using the aging method, the balance of Allowance for Doubtful Accounts is estimated as \$225,000.

Determine (a) the amount of the adjusting entry for uncollectible accounts; (b) the adjusted balances of Accounts Receivable, Allowance for Doubtful Accounts, and Bad Debt Expense; and (c) the net realizable value of accounts receivable.

#### **EE 8-4** p. 375 **PE 8-4B** Analysis of receivables method

OBJ. 4



At the end of the current year, Accounts Receivable has a balance of \$3,460,000; Allowance for Doubtful Accounts has a debit balance of \$12,500; and sales for the year total \$46,300,000. Using the aging method, the balance of Allowance for Doubtful Accounts is estimated as \$245,000.

Determine (a) the amount of the adjusting entry for uncollectible accounts; (b) the adjusted balances of Accounts Receivable, Allowance for Doubtful Accounts, and Bad Debt Expense; and (c) the net realizable value of accounts receivable.

#### EE 8-5 p. 379 PE 8-5A Note receivable

OBJ. 6

Guzman Company received a 60-day, 5% note for \$54,000 dated July 12 from a customer on account.

- a. Determine the due date of the note.
- b. Determine the maturity value of the note.
- c. Journalize the entry to record the receipt of the payment of the note at maturity.



ME HOW

#### **EE 8-5** *p. 379*

#### PE 8-5B Note receivable

OBJ. 6

Prefix Supply Company received a 120-day, 8% note for \$450,000, dated April 9 from a customer on account.

- a. Determine the due date of the note.
- b. Determine the maturity value of the note.
- c. Journalize the entry to record the receipt of the payment of the note at maturity.

#### **EE 8-6** p. 381

#### PE 8-6A Accounts receivable turnover and number of days' sales in receivables OBJ. 8

Financial statement data for years ending December 31 for Chiro-Solutions Company follows:

	2016	2015
Sales	\$2,912,000	\$2,958,000
Accounts receivable:		
Beginning of year	300,000	280,000
End of year	340.000	300.000

- a. Determine the accounts receivable turnover for 2016 and 2015.
- b. Determine the number of days' sales in receivables for 2016 and 2015. Use 365 days and round to one decimal place.
- c. Does the change in accounts receivable turnover and the number of days' sales in receivables from 2015 to 2016 indicate a favorable or an unfavorable trend?

#### **EE 8-6** p. 381

#### PE 8-6B Accounts receivable turnover and number of days' sales in receivables OBJ. 8

Financial statement data for years ending December 31 for Robinhood Company follows:

	2016	2015
Sales	\$7,906,000	\$6,726,000
Accounts receivable:		
Beginning of year	600,000	540,000
End of year	580,000	600,000

- a. Determine the accounts receivable turnover for 2016 and 2015.
- b. Determine the number of days' sales in receivables for 2016 and 2015. Use 365 days and round to one decimal place.
- c. Does the change in accounts receivable turnover and the number of days' sales in receivables from 2015 to 2016 indicate a favorable or an unfavorable trend?

## **Exercises**

#### EX 8-1 Classifications of receivables

OBJ. 1

Boeing is one of the world's major aerospace firms with operations involving commercial aircraft, military aircraft, missiles, satellite systems, and information and battle management systems. As of a recent year, Boeing had \$2,788 million of receivables involving U.S. government contracts and \$903 million of receivables involving commercial aircraft customers, such as Delta Air Lines and United Airlines.

Should Boeing report these receivables separately in the financial statements or combine them into one overall accounts receivable amount? Explain.



ME HOW

#### EX 8-2 Nature of uncollectible accounts

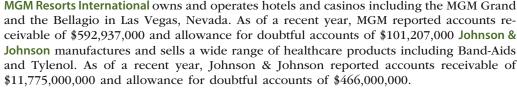
OBJ. 2

**57** A

✓ a. 17.1%



SHOW MF HOW



- a. Compute the percentage of the allowance for doubtful accounts to the accounts receivable for MGM Resorts International. Round to one decimal place.
- b. Compute the percentage of the allowance for doubtful accounts to the accounts receivable for Johnson & Johnson. Round to one decimal place.
- c. Discuss possible reasons for the difference in the two ratios computed in (a) and (b).



OBJ. 3

Journalize the following transactions in the accounts of Midwest Medical Co., a medical equipment company that uses the direct write-off method of accounting for uncollectible receivables:

- Feb. 3. Sold merchandise on account to Dr. Jill Hall, \$17,340. The cost of the merchandise sold was \$9,500.
- Sept.10. Received \$5,000 from Dr. Jill Hall and wrote off the remainder owed on the sale of February 3 as uncollectible.
- Dec. 21. Reinstated the account of Dr. Jill Hall that had been written off on September 10 and received \$12,340 cash in full payment.



OBJ. 4

Journalize the following transactions in the accounts of Dining Interiors Company, a restaurant supply company that uses the allowance method of accounting for uncollectible receivables:

- Apr. 2. Sold merchandise on account to Peking Palace Co., \$41,900. The cost of the merchandise sold was \$24,850.
- June 9. Received \$10,000 from Peking Palace Co. and wrote off the remainder owed on the sale of April 2 as uncollectible.
- Oct. 31. Reinstated the account of Peking Palace Co. that had been written off on June 9 and received \$31,900 cash in full payment.

#### EX 8-5 Entries to write off accounts receivable

OBJ. 3, 4

Creative Solutions Company, a computer consulting firm, has decided to write off the \$11,750 balance of an account owed by a customer, Wil Treadwell. Journalize the entry to record the write-off, assuming that (a) the direct write-off method is used and (b) the allowance method is used.

#### EX 8-6 Providing for doubtful accounts

OBJ. 4

At the end of the current year, the accounts receivable account has a debit balance of \$1,400,000 and sales for the year total \$15,350,000. Determine the amount of the adjusting entry to provide for doubtful accounts under each of the following assumptions:

- a. The allowance account before adjustment has a debit balance of \$23,000. Bad debt expense is estimated at 34 of 1% of sales.
- b. The allowance account before adjustment has a debit balance of \$23,000. An aging of the accounts in the customer ledger indicates estimated doubtful accounts of \$125,000.
- c. The allowance account before adjustment has a credit balance of \$14,500. Bad debt expense is estimated at ½ of 1% of sales.
- d. The allowance account before adjustment has a credit balance of \$14,500. An aging of the accounts in the customer ledger indicates estimated doubtful accounts of \$180,000.





✓ a. \$115,125✓ b. \$148,000



#### EX 8-7 Number of days past due

**OBJ. 4** 

✓ Avalanche Auto, 84 days Toot Auto Supply distributes new and used automobile parts to local dealers throughout the Midwest. Toot's credit terms are n/30. As of the end of business on October 31, the following accounts receivable were past due:

Account	<b>Due Date</b>	Amount
Avalanche Auto	August 8	\$12,000
Bales Auto	October 11	2,400
Derby Auto Repair	June 23	3,900
Lucky's Auto Repair	September 2	6,600
Pit Stop Auto	September 19	1,100
Reliable Auto Repair	July 15	9,750
Trident Auto	August 24	1,800
Valley Repair & Tow	May 17	4,000

Determine the number of days each account is past due as of October 31.

#### EX 8-8 Aging of receivables schedule

OBJ. 4

The accounts receivable clerk for Waddell Industries prepared the following partially completed aging of receivables schedule as of the end of business on August 31:

	Α	В	С	D	E	F	G
1			Not	Days Past Due			
2			Past				Over
3	Customer	Balance	Due	1-30	31-60	61-90	90
4	Acme Industries Inc.	3,000	3,000				
5	Alliance Company	4,500		4,500			
21	Zollinger Company	5,000			5,000		
22	Subtotals	1,050,000	600,000	220,000	115,000	85,000	30,000

The following accounts were unintentionally omitted from the aging schedule and not included in the preceding subtotals:

Customer	Balance	Due Date
Builders Industries	\$44,500	May 1
Elkhorn Company	21,000	June 20
Granite Creek Inc.	7,500	July 13
Lockwood Company	14,000	September 9
Teton Company	13,000	August 7

- a. Determine the number of days past due for each of the preceding accounts as of August 31.
- b. Complete the aging of receivables schedule by adding the omitted accounts to the bottom of the schedule and updating the totals.

#### EX 8-9 Estimating allowance for doubtful accounts

**OBJ. 4** 

Waddell Industries has a past history of uncollectible accounts, as follows. Estimate the allowance for doubtful accounts, based on the aging of receivables schedule you completed in Exercise 8-8.

Age Class	Uncollectible
Not past due	3%
1–30 days past due	4
31–60 days past due	15
61–90 days past due	35
Over 90 days past due	80





✓ Allowance for doubtful accounts, \$142,815











**OBJ. 4** 

Using data in Exercise 8-9, assume that the allowance for doubtful accounts for Waddell Industries has a credit balance of \$6,350 before adjustment on August 31. Journalize the adjusting entry for uncollectible accounts as of August 31.

#### EX 8-11 Estimating doubtful accounts

**OBJ. 4** 

Selby's Bike Co. is a wholesaler of motorcycle supplies. An aging of the company's accounts receivable on December 31, 2016, and a historical analysis of the percentage of uncollectible accounts in each age category are as follows:

Age Interval	Balance	Percent Uncollectible
Not past due	\$1,250,000	3/4%
1–30 days past due	500,000	3
31-60 days past due	190,000	5
61–90 days past due	60,000	15
91–180 days past due	36,000	40
Over 180 days past due	24,000	80
	\$2,060,000	

Estimate what the proper balance of the allowance for doubtful accounts should be as of December 31, 2016.

#### EX 8-12 Entry for uncollectible accounts

OBJ. 4

Using the data in Exercise 8-11, assume that the allowance for doubtful accounts for Selby's Bike Co. had a debit balance of \$7,200 as of December 31, 2016.

Journalize the adjusting entry for uncollectible accounts as of December 31, 2016.

## EX 8-13 Entries for bad debt expense under the direct write-off and allowance OBJ. 5 methods

The following selected transactions were taken from the records of Shipway Company for the first year of its operations ending December 31, 2016:

- Apr. 13. Wrote off account of Dean Sheppard, \$8,450.
- May 15. Received \$500 as partial payment on the \$7,100 account of Dan Pyle. Wrote off the remaining balance as uncollectible.
- July 27. Received \$8,450 from Dean Sheppard, whose account had been written off on April 13. Reinstated the account and recorded the cash receipt.
- Dec. 31. Wrote off the following accounts as uncollectible (record as one journal entry):

Paul Chapman	\$2,225
Duane DeRosa	3,550
Teresa Galloway	4,770
Ernie Klatt	1,275
Marty Richey	1,690

- 31. If necessary, record the year-end adjusting entry for uncollectible accounts.
- a. Journalize the transactions for 2016 under the direct write-off method.
- b. Journalize the transactions for 2016 under the allowance method. Shipway Company uses the percent of credit sales method of estimating uncollectible accounts expense. Based on past history and industry averages, 34% of credit sales are expected to be uncollectible. Shipway Company recorded \$3,778,000 of credit sales during 2016.
- c. How much higher (lower) would Shipway Company's net income have been under the direct write-off method than under the allowance method?



✓ c. \$8,225 higher



## EX 8-14 Entries for bad debt expense under the direct write-off and allowance OBJ. 5 methods

✓ c. \$11,090 higher





The following selected transactions were taken from the records of Rustic Tables Company for the year ending December 31, 2016:

- June 8. Wrote off account of Kathy Quantel, \$8,440.
- Aug. 14. Received \$3,000 as partial payment on the \$12,500 account of Rosalie Oakes. Wrote off the remaining balance as uncollectible.
- Oct. 16. Received the \$8,440 from Kathy Quantel, whose account had been written off on June 8. Reinstated the account and recorded the cash receipt.
- Dec. 31. Wrote off the following accounts as uncollectible (record as one journal entry):

Wade Dolan	\$4,600
Greg Gagne	3,600
Amber Kisko	7,150
Shannon Poole	2,975
Niki Spence	6,630

- 31. If necessary, record the year-end adjusting entry for uncollectible accounts.
- a. Journalize the transactions for 2016 under the direct write-off method.
- b. Journalize the transactions for 2016 under the allowance method, assuming that the allowance account had a beginning balance of \$36,000 on January 1, 2016, and the company uses the analysis of receivables method. Rustic Tables Company prepared the following aging schedule for its accounts receivable:

Aging Class (Number of Days Past Due)	Receivables Balance on December 31	Estimated Percent of Uncollectible Accounts
0–30 days	\$320,000	1%
31-60 days	110,000	3
61-90 days	24,000	10
91–120 days	18,000	33
More than 120 days	43,000	75
Total receivables	\$515,000	

c. How much higher (lower) would Rustic Tables' 2016 net income have been under the direct write-off method than under the allowance method?

#### EX 8-15 Effect of doubtful accounts on net income

OBJ. 5

During its first year of operations, Mack's Plumbing Supply Co. had sales of \$3,250,000, wrote off \$27,800 of accounts as uncollectible using the direct write-off method, and reported net income of \$487,500. Determine what the net income would have been if the allowance method had been used, and the company estimated that 1% of sales would be uncollectible.

#### EX 8-16 Effect of doubtful accounts on net income

OBJ. 5

Using the data in Exercise 8-15, assume that during the second year of operations Mack's Plumbing Supply Co. had sales of \$4,100,000, wrote off \$34,000 of accounts as uncollectible using the direct write-off method, and reported net income of \$600,000.

- a. Determine what net income would have been in the second year if the allowance method (using 1% of sales) had been used in both the first and second years.
- b. Determine what the balance of the allowance for doubtful accounts would have been at the end of the second year if the allowance method had been used in both the first and second years.

✓ b. \$11,700 credit balance

## EX 8-17 Entries for bad debt expense under the direct write-off and allowance OBJ. 5 methods

✓ c. \$9,375 higher



Casebolt Company wrote off the following accounts receivable as uncollectible for the first year of its operations ending December 31, 2016:

Customer	Amount
Shawn Brooke	\$ 4,650
Eve Denton	5,180
Art Malloy	11,050
Cassie Yost	9,120
Total	\$30,000

- a. Journalize the write-offs for 2016 under the direct write-off method.
- b. Journalize the write-offs for 2016 under the allowance method. Also, journalize the adjusting entry for uncollectible accounts. The company recorded \$5,250,000 of credit sales during 2016. Based on past history and industry averages, 34% of credit sales are expected to be uncollectible.
- c. How much higher (lower) would Casebolt Company's 2016 net income have been under the direct write-off method than under the allowance method?

## EX 8-18 Entries for bad debt expense under the direct write-off and allowance OBJ. 5 methods

Seaforth International wrote off the following accounts receivable as uncollectible for the year ending December 31, 2016:

Customer	Amount
Kim Abel	\$ 21,550
Lee Drake	33,925
Jenny Green	27,565
Mike Lamb	19,460
Total	\$102,500

The company prepared the following aging schedule for its accounts receivable on December 31, 2016:

Aging Class (Number of Days Past Due)	Receivables Balance on December 31	Estimated Percent of Uncollectible Accounts
0–30 days	\$ 715,000	1%
31-60 days	310,000	2
61-90 days	102,000	15
91–120 days	76,000	30
More than 120 days	97,000	60
Total receivables	\$1,300,000	

- a. Journalize the write-offs for 2016 under the direct write-off method.
- b. Journalize the write-offs and the year-end adjusting entry for 2016 under the allowance method, assuming that the allowance account had a beginning balance of \$95,000 on January 1, 2016, and the company uses the analysis of receivables method.
- c. How much higher (lower) would Seaforth International's 2016 net income have been under the allowance method than under the direct write-off method?

#### EX 8-19 Determine due date and interest on notes

OBJ. 6

✓ a. May 2, \$1,600





**✓** b. \$77,250



Determine the due date and the amount of interest due at maturity on the following notes dated in 2016:

	<b>Date of Note</b>	Face Amount	Interest Rate	Term of Note
a.	January 3*	\$80,000	6%	120 days
b.	February 20*	27,000	4	30 days
c.	May 24	62,500	8	45 days
d.	August 30	30,000	5	90 days
e.	October 4	40,000	7	90 days
* February	2016 has 29 days.			

#### EX 8-20 Entries for notes receivable

OBJ. 6

Master Designs Decorators issued a 180-day, 6% note for \$75,000, dated May 14, 2016, to Morgan Furniture Company on account.

- a. Determine the due date of the note.
- b. Determine the maturity value of the note.
- c. Journalize the entries to record the following: (1) receipt of the note by Morgan Furniture and (2) receipt of payment of the note at maturity.

#### EX 8-21 Entries for notes receivable

OBJ. 6

The series of seven transactions recorded in the following T accounts were related to a sale to a customer on account and the receipt of the amount owed. Briefly describe each transaction.

CASH			NOTES RECEIVABLE			Ē	
(7)	61,509			(5)	60,000	(6)	60,000
	ACCOUNTS	RECEIVAI	BLE	SALES RETURNS AND ALLOWANCES			
(1)	75,000	(3)	15,000	(3)	15,000		
(6)	60,600	(5)	60,000				
		(7)	60,600				
	MERCHANDIS	E INVEN	TORY	c	OST OF MERC	HANDISE	SOLD
(4)	9,000	(2)	45,000	(2)	45,000	(4)	9,000
	SAI	LES		INTEREST REVENUE			
		(1)	75,000			(6)	600
						(7)	909

#### EX 8-22 Entries for notes receivable, including year-end entries

OBJ. 6

The following selected transactions were completed by Zippy Do Co., a supplier of zippers for clothing:

2015

- Dec. 3. Received from Chicago Clothing & Bags Co., on account, a \$36,000, 90-day, 6% note dated December 3.
  - 31. Recorded an adjusting entry for accrued interest on the note of December 3.
  - 31. Recorded the closing entry for interest revenue.

2016

Mar. 2. Received payment of note and interest from Chicago Clothing & Bags Co. Journalize the entries to record the transactions.



#### EX 8-23 Entries for receipt and dishonor of note receivable

OBJ. 6

Journalize the following transactions of Trapper Jon's Productions:

- June 23. Received a \$48,000, 90-day, 8% note dated June 23 from Radon Express Co. on account.
- Sept. 21. The note is dishonored by Radon Express Co.
- Oct. 21. Received the amount due on the dishonored note plus interest for 30 days at 10% on the total amount charged to Radon Express Co. on September 21.

#### EX 8-24 Entries for receipt and dishonor of notes receivable

**OBJ. 4, 6** 

Journalize the following transactions in the accounts of Safari Games Co., which operates a riverboat casino:

- Apr. 18. Received a \$60,000, 30-day, 7% note dated April 18 from Glenn Cross on account.
  - 30. Received a \$42,000, 60-day, 8% note dated April 30 from Rhoni Melville on account.
- May 18. The note dated April 18 from Glenn Cross is dishonored, and the customer's account is charged for the note, including interest.
- June 29. The note dated April 30 from Rhoni Melville is dishonored, and the customer's account is charged for the note, including interest.
- Aug. 16. Cash is received for the amount due on the dishonored note dated April 18 plus interest for 90 days at 8% on the total amount debited to Glenn Cross on May 18.
- Oct. 22. Wrote off against the allowance account the amount charged to Rhoni Melville on June 29 for the dishonored note dated April 30.

#### EX 8-25 Receivables on the balance sheet

**OBJ. 7** 

List any errors you can find in the following partial balance sheet:

	lance Sheet mber 31, 2016			
	Assets			
Current assets:				
Cash				\$ 78,500
Notes receivable	:	\$	300,000	
Less interest receivable			4,500	295,500
Accounts receivable		\$1	,200,000	

11,500

1,211,500

Napa Vino Company

#### EX 8-26 Accounts receivable turnover and days' sales in receivables

Plus allowance for doubtful accounts

**OBJ. 8** 

Polo Ralph Lauren Corporation designs, markets, and distributes a variety of apparel, home decor, accessory, and fragrance products. The company's products include such brands as Polo by Ralph Lauren, Ralph Lauren Purple Label, Ralph Lauren, Polo Jeans Co., and Chaps. Polo Ralph Lauren reported the following (in thousands) for two recent years:

## ✓ a. Year 2: 10.7









(Continued)

Assume that accounts receivable (in millions) were \$486,200 at the beginning of Year 1.

- a. Compute the accounts receivable turnover for Year 2 and Year 1. Round to one decimal place.
- b. Compute the days' sales in receivables for Year 2 and Year 1. Use 365 days and round to one decimal place.
- c. What conclusions can be drawn from these analyses regarding Ralph Lauren's efficiency in collecting receivables?

#### EX 8-27 Accounts receivable turnover and days' sales in receivables

OBJ. 8

✓ a. Year 2: 10.3





**H.J. Heinz Company** was founded in 1869 at Sharpsburg, Pennsylvania, by Henry J. Heinz. The company manufactures and markets food products throughout the world, including ketchup, condiments and sauces, frozen food, pet food, soups, and tuna. For two recent years, H.J. Heinz reported the following (in thousands):

	Year 2	Year 1
Sales	\$11,649,079	\$10,706,588
Accounts receivable	993,510	1,265,032

Assume that the accounts receivable (in thousands) were \$1,045,338 at the beginning of Year 1.

- a. Compute the accounts receivable turnover for Year 2 and Year 1. Round to one decimal place.
- b. Compute the days' sales in receivables at the end of Year 2 and Year 1. Use 365 days and round to one decimal place.
- c. What conclusions can be drawn from these analyses regarding Heinz's efficiency in collecting receivables?

#### EX 8-28 Accounts receivable turnover and days' sales in receivables

**OBJ. 8** 





The Limited Brands Inc. sells women's clothing and personal health care products through specialty retail stores including Victoria's Secret and Bath & Body Works stores. The Limited Brands reported the following (in millions) for two recent years:

	Year 2	Year 1
Sales	\$10,364	\$9,613
Accounts receivable	269	267

Assume that accounts receivable (in millions) were \$249 at the beginning of Year 1.

- a. Compute the accounts receivable turnover for Year 2 and Year 1. Round to one decimal place.
- b. Compute the day's sales in receivables for Year 2 and Year 1. Use 365 days and round to one decimal place.
- c. What conclusions can be drawn from these analyses regarding The Limited Brands' efficiency in collecting receivables?

#### EX 8-29 Accounts receivable turnover

OBJ. 8





Use the data in Exercises 8-27 and 8-28 to analyze the accounts receivable turnover ratios of H.J. Heinz Company and The Limited Brands Inc.

- a. Compute the average accounts receivable turnover ratio for The Limited Brands Inc. and H.J. Heinz Company for the years shown in Exercises 8-27 and 8-28.
- b. Does The Limited Brands or H.J. Heinz Company have the higher average accounts receivable turnover ratio?
- c. Explain the logic underlying your answer in (b).

# **Problems: Series A**

#### √ 3. \$1,749,300

General Ledger



#### PR 8-1A Entries related to uncollectible accounts

**OBJ. 4** 

The following transactions were completed by The Irvine Company during the current fiscal year ended December 31:

- Feb. 8. Received 40% of the \$18,000 balance owed by DeCoy Co., a bankrupt business, and wrote off the remainder as uncollectible.
- May 27. Reinstated the account of Seth Nelsen, which had been written off in the preceding year as uncollectible. Journalized the receipt of \$7,350 cash in full payment of Seth's account.
- Aug. 13. Wrote off the \$6,400 balance owed by Kat Tracks Co., which has no assets.
- Oct. 31. Reinstated the account of Crawford Co., which had been written off in the preceding year as uncollectible. Journalized the receipt of \$3,880 cash in full payment of the account.
- Dec. 31. Wrote off the following accounts as uncollectible (compound entry): Newbauer Co., \$7,190; Bonneville Co., \$5,500; Crow Distributors, \$9,400; Fiber Optics, \$1,110.
  - 31. Based on an analysis of the \$1,785,000 of accounts receivable, it was estimated that \$35,700 will be uncollectible. Journalized the adjusting entry.

#### **Instructions**

- Record the January 1 credit balance of \$26,000 in a T account for Allowance for Doubtful Accounts.
- 2. Journalize the transactions. Post each entry that affects the following selected T accounts and determine the new balances:

Allowance for Doubtful Accounts Bad Debt Expense

- 3. Determine the expected net realizable value of the accounts receivable as of December 31.
- 4. Assuming that instead of basing the provision for uncollectible accounts on an analysis of receivables, the adjusting entry on December 31 had been based on an estimated expense of ¼ of 1% of the sales of \$18,200,000 for the year, determine the following:
  - a. Bad debt expense for the year.
  - b. Balance in the allowance account after the adjustment of December 31.
  - c. Expected net realizable value of the accounts receivable as of December 31.

#### PR 8-2A Aging of receivables; estimating allowance for doubtful accounts

OBJ. 4

Trophy Fish Company supplies flies and fishing gear to sporting goods stores and outfitters throughout the western United States. The accounts receivable clerk for Trophy Fish prepared the following partially completed aging of receivables schedule as of the end of business on December 31, 2015:

	А	В	С	D	Е	F	G	Н
1			Not	Days Past Due				
2			Past					
3	Customer	Balance	Due	1-30	31-60	61-90	91-120	Over 120
4	AAA Outfitters	20,000	20,000					
5	Brown Trout Fly Shop	7,500			7,500			

30	Zigs Fish Adventures	4,000		4,000				
31	Subtotals	1,300,000	750,000	290,000	120,000	40,000	20,000	80,000

(Continued)

√ 3. \$121,000



The following accounts were unintentionally omitted from the aging schedule:

Customer	<b>Due Date</b>	Balance
Adams Sports & Flies	May 22, 2015	\$5,000
Blue Dun Flies	Oct. 10, 2015	4,900
Cicada Fish Co.	Sept. 29, 2015	8,400
Deschutes Sports	Oct. 20, 2015	7,000
Green River Sports	Nov. 7, 2015	3,500
Smith River Co.	Nov. 28, 2015	2,400
Western Trout Company	Dec. 7, 2015	6,800
Wolfe Sports	Jan. 20, 2016	4,400

Trophy Fish has a past history of uncollectible accounts by age category, as follows:

Age Class	Percent Uncollectible
Not past due	1%
1–30 days past due	2
31-60 days past due	10
61-90 days past due	30
91–120 days past due	40
Over 120 days past due	80

#### **Instructions**

- 1. Determine the number of days past due for each of the preceding accounts.
- 2. Complete the aging of receivables schedule by adding the omitted accounts to the bottom of the schedule and updating the totals.
- 3. Estimate the allowance for doubtful accounts, based on the aging of receivables schedule.
- 4. Assume that the allowance for doubtful accounts for Trophy Fish Company has a debit balance of \$3,600 before adjustment on December 31, 2015. Journalize the adjusting entry for uncollectible accounts.
- 5. Assume that the adjusting entry in (4) was inadvertently omitted, how would the omission affect the balance sheet and income statement?

#### PR 8-3A Compare two methods of accounting for uncollectible receivables OBJ. 3, 4

✓ 1. Year 4: Balance of allowance account, end of year, \$15,050

Call Systems Company, a telephone service and supply company, has just completed its fourth year of operations. The direct write-off method of recording bad debt expense has been used during the entire period. Because of substantial increases in sales volume and the amount of uncollectible accounts, the company is considering changing to the allowance method. Information is requested as to the effect that an annual provision of 1% of sales would have had on the amount of bad debt expense reported for each of the past four years. It is also considered desirable to know what the balance of Allowance for Doubtful Accounts would have been at the end of each year. The following data have been obtained from the accounts:

Year of Origin of				
<b>Accounts Receivable Written</b>				
Off as Uncollectible				

Year	Sales	Uncollectible Accounts Written Off	1st	2nd	3rd	4th
1st	\$ 900,000	\$ 4,500	\$4,500			
2nd	1,250,000	9,600	3,000	\$6,600		
3rd	1,500,000	12,800	1,000	3,700	\$8,100	
4th	2,200,000	16,550		1,500	4,300	\$10,750

#### **Instructions**

1. Assemble the desired data, using the following column headings:

		Bad Debt Expense		
	Expense Actually	Expense Based on	Increase (Decrease) in Amount	Balance of Allowance Account,
Year	Reported	Estimate	of Expense	End of Year

2. Experience during the first four years of operations indicated that the receivables were either collected within two years or had to be written off as uncollectible. Does the estimate of 1% of sales appear to be reasonably close to the actual experience with uncollectible accounts originating during the first two years? Explain.

#### PR 8-4A Details of notes receivable and related entries

OBJ. 6

Flush Mate Co. wholesales bathroom fixtures. During the current fiscal year, Flush Mate Co. received the following notes:

	Date	Face Amount	Term	Interest Rate
1.	Mar. 6	\$80,000	45 days	5%
2.	Apr. 23	24,000	60 days	9
3.	July 20	42,000	120 days	6
4.	Sept. 6	54,000	90 days	7
5.	Nov. 29	27,000	60 days	6
6.	Dec. 30	72,000	30 days	5

**Instructions** 

- 1. Determine for each note (a) the due date and (b) the amount of interest due at maturity, identifying each note by number.
- 2. Journalize the entry to record the dishonor of Note (3) on its due date.
- 3. Journalize the adjusting entry to record the accrued interest on Notes (5) and (6) on December 31.
- 4. Journalize the entries to record the receipt of the amounts due on Notes (5) and (6) in January.

#### PR 8-5A Notes receivable entries

**OBJ.** 6

The following data relate to notes receivable and interest for CGH Cable Co., a cable manufacturer and supplier. (All notes are dated as of the day they are received.)

- Apr. 10. Received a \$144,000, 5%, 60-day note on account.
- May 15. Received a \$270,000, 7%, 120-day note on account.
- June 9. Received \$145,200 on note of April 10.
- Aug. 22. Received a \$150,000, 4%, 45-day note on account.
- Sept.12. Received \$276,300 on note of May 15.
  - 30. Received a \$210,000, 8%, 60-day note on account.
- Oct. 6. Received \$150,750 on note of August 22.
  - 18. Received a 120,000, 5%, 60-day note on account.
- Nov. 29. Received \$212,800 on note of September 30.
- Dec. 17. Received \$121,000 on note of October 18.

#### **Instructions**

Journalize the entries to record the transactions.

✓ 1. Note 2: Due date, June 22; Interest due at maturity, \$360



General Ledger

#### PR 8-6A Sales and notes receivable transactions

OBJ. 6

The following were selected from among the transactions completed by Caldemeyer Co. during the current year. Caldemeyer Co. sells and installs home and business security systems.

- Jan. 3. Loaned \$18,000 cash to Trina Gelhaus, receiving a 90-day, 8% note.
- Feb. 10. Sold merchandise on account to Bradford & Co., \$24,000. The cost of the merchandise sold was \$14,400.
  - 13. Sold merchandise on account to Dry Creek Co., \$60,000. The cost of merchandise sold was \$54,000.
- Mar. 12. Accepted a 60-day, 7% note for \$24,000 from Bradford & Co. on account.
  - 14. Accepted a 60-day, 9% note for \$60,000 from Dry Creek Co. on account.
- Apr. 3. Received the interest due from Trina Gelhaus and a new 120-day, 9% note as a renewal of the loan of January 3. (Record both the debit and the credit to the notes receivable account.)
- May 11. Received from Bradford & Co. the amount due on the note of March 12.
  - 13. Dry Creek Co. dishonored its note dated March 14.
- July 12. Received from Dry Creek Co. the amount owed on the dishonored note, plus interest for 60 days at 12% computed on the maturity value of the note.
- Aug. 1. Received from Trina Gelhaus the amount due on her note of April 3.
- Oct. 5. Sold merchandise on account to Halloran Co., \$13,500. The cost of the merchandise sold was \$8,100.
  - 15. Received from Halloran Co. the amount of the invoice of October 5, less 2% discount.

#### Instructions

Journalize the entries to record the transactions.

# **Problems: Series B**

#### PR 8-1B Entries related to uncollectible accounts

OBJ. 4

The following transactions were completed by The Wild Trout Gallery during the current fiscal year ended December 31:

- Jan. 19. Reinstated the account of Arlene Gurley, which had been written off in the preceding year as uncollectible. Journalized the receipt of \$2,660 cash in full payment of Arlene's account.
- Apr. 3. Wrote off the \$12,750 balance owed by Premier GS Co., which is bankrupt.
- July 16. Received 25% of the \$22,000 balance owed by Hayden Co., a bankrupt business, and wrote off the remainder as uncollectible.
- Nov. 23. Reinstated the account of Harry Carr, which had been written off two years earlier as uncollectible. Recorded the receipt of \$4,000 cash in full payment.
- Dec. 31. Wrote off the following accounts as uncollectible (compound entry): Cavey Co., \$3,300; Fogle Co., \$8,100; Lake Furniture, \$11,400; Melinda Shryer, \$1,200.
  - 31. Based on an analysis of the \$2,350,000 of accounts receivable, it was estimated that \$60,000 will be uncollectible. Journalized the adjusting entry.

#### Instructions

1. Record the January 1 credit balance of \$50,000 in a T account for Allowance for Doubtful Accounts.

✓ 3. \$2,290,000

General Ledger



SHOW

2. Journalize the transactions. Post each entry that affects the following T accounts and determine the new balances:

Allowance for Doubtful Accounts Bad Debt Expense

- 3. Determine the expected net realizable value of the accounts receivable as of December 31.
- 4. Assuming that instead of basing the provision for uncollectible accounts on an analysis of receivables, the adjusting entry on December 31 had been based on an estimated expense of ½ of 1% of the sales of \$15,800,000 for the year, determine the following:
  - a. Bad debt expense for the year.
  - b. Balance in the allowance account after the adjustment of December 31.
  - c. Expected net realizable value of the accounts receivable as of December 31.

#### PR 8-2B Aging of receivables; estimating allowance for doubtful accounts

OBJ. 4

Wig Creations Company supplies wigs and hair care products to beauty salons throughout Texas and the Southwest. The accounts receivable clerk for Wig Creations prepared the following partially completed aging of receivables schedule as of the end of business on December 31, 2015:

	А	В	С	D	Е	F	G	Н
1			Not	Days Past Due				
2			Past					
3	Customer	Balance	Due	1-30	31-60	61-90	91-120	Over 120
4	ABC Beauty	15,000	15,000					
5	Angel Wigs	8,000			8,000			

30	Zodiac Beauty	3,000		3,000				
31	Subtotals	875,000	415,000	210,000	112,000	55,000	18,000	65,000

The following accounts were unintentionally omitted from the aging schedule:

Customer	Due Date	Balance
Arcade Beauty	Aug. 17, 2015	\$10,000
Creative Images	Oct. 30, 2015	8,500
Excel Hair Products	July 3, 2015	7,500
First Class Hair Care	Sept. 8, 2015	6,600
Golden Images	Nov. 23, 2015	3,600
Oh That Hair	Nov. 29, 2015	1,400
One Stop Hair Designs	Dec. 7, 2015	4,000
Visions Hair & Nail	Jan. 11, 2016	9,000

Wig Creations has a past history of uncollectible accounts by age category, as follows:

Age Class	Percent Uncollectible
Not past due	1%
1-30 days past due	4
31–60 days past due	16
61–90 days past due	25
91-120 days past due	40
Over 120 days past due	80

#### Instructions

- 1. Determine the number of days past due for each of the preceding accounts.
- 2. Complete the aging of receivables schedule by adding the omitted accounts to the bottom of the schedule and updating the totals.

(Continued)

√ 3. \$123,235



- 3. Estimate the allowance for doubtful accounts, based on the aging of receivables schedule.
- 4. Assume that the allowance for doubtful accounts for Wig Creations has a credit balance of \$7,375 before adjustment on December 31, 2015. Journalize the adjustment for uncollectible accounts.
- 5. Assume that the adjusting entry in (4) was inadvertently omitted, how would the omission affect the balance sheet and income statement?

#### PR 8-3B Compare two methods of accounting for uncollectible receivables OBJ. 3, 4, 5

✓ 1. Year 4: Balance of allowance account, end of year, \$32,550

Digital Depot Company, which operates a chain of 40 electronics supply stores, has just completed its fourth year of operations. The direct write-off method of recording bad debt expense has been used during the entire period. Because of substantial increases in sales volume and the amount of uncollectible accounts, the firm is considering changing to the allowance method. Information is requested as to the effect that an annual provision of ¼% of sales would have had on the amount of bad debt expense reported for each of the past four years. It is also considered desirable to know what the balance of Allowance for Doubtful Accounts would have been at the end of each year. The following data have been obtained from the accounts:

#### Year of Origin of Accounts Receivable Written Off as Uncollectible

Year	Sales	Uncollectible Accounts Written Off	1st	2nd	3rd	4th
1st	\$12,500,000	\$18,000	\$18,000			
2nd	14,800,000	30,200	9,000	\$21,200		
3rd	18,000,000	39,900	3,600	9,300	\$27,000	
4th	24,000,000	52,600		5,100	12,500	\$35,000

#### **Instructions**

1. Assemble the desired data, using the following column headings:

		Bad Debt Expens	e	
			Increase	
	Expense	Expense	(Decrease)	Balance of
	Actually	Based on	in Amount	Allowance Account,
Year	Reported	Estimate	of Expense	End of Year

2. Experience during the first four years of operations indicated that the receivables were either collected within two years or had to be written off as uncollectible. Does the estimate of 1/4% of sales appear to be reasonably close to the actual experience with uncollectible accounts originating during the first two years? Explain.

#### PR 8-4B Details of notes receivable and related entries

OBJ. 6

Gen-X Ads Co. produces advertising videos. During the current fiscal year, Gen-X Ads Co. received the following notes:

	Date	Face Amount	Term	Interest Rate
1.	Jan. 14	\$33,000	30 days	4%
2.	Mar. 9	60,000	45 days	7
3.	July 12	48,000	90 days	5
4.	Aug. 23	16,000	75 days	6
5.	Nov. 15	36,000	60 days	8
6.	Dec. 10	24,000	60 days	6

#### Instructions

1. Determine for each note (a) the due date and (b) the amount of interest due at maturity, identifying each note by number.

✓ 1. Note 1: Due date, Feb. 13; Interest due at maturity, \$110



- 2. Journalize the entry to record the dishonor of Note (3) on its due date.
- 3. Journalize the adjusting entry to record the accrued interest on Notes (5) and (6) on December 31.
- 4. Journalize the entries to record the receipt of the amounts due on Notes (5) and (6) in January and February.

#### PR 8-5B Notes receivable entries

ORL 6

The following data relate to notes receivable and interest for Owens Co., a financial services company. (All notes are dated as of the day they are received.)

- Mar. 8. Received a \$33,000, 5%, 60-day note on account.
  - 31. Received an \$80,000, 7%, 90-day note on account.
- May 7. Received \$33,275 on note of March 8.
  - 16. Received a \$72,000, 7%, 90-day note on account.
- June 11. Received a \$36,000, 6%, 45-day note on account.
  - 29. Received \$81,400 on note of March 31.
- July 26. Received \$36,270 on note of June 11.
- Aug. 4. Received a \$48,000, 9%, 120-day note on account.
  - 14. Received \$73,260 on note of May 16.
- Dec. 2. Received \$49,440 on note of August 4.

#### **Instructions**

Journalize the entries to record the transactions.

#### PR 8-6B Sales and notes receivable transactions

OBJ. 6

The following were selected from among the transactions completed during the current year by Danix Co., an appliance wholesale company:

- Jan. 21. Sold merchandise on account to Black Tie Co., \$28,000. The cost of merchandise sold was \$16,800.
- Mar. 18. Accepted a 60-day, 6% note for \$28,000 from Black Tie Co. on account.
- May 17. Received from Black Tie Co. the amount due on the note of March 18.
- June 15. Sold merchandise on account to Pioneer Co. for \$17,700. The cost of merchandise sold was \$10,600.
  - 21. Loaned \$18,000 cash to JR Stutts, receiving a 30-day, 8% note.
  - 25. Received from Pioneer Co. the amount due on the invoice of June 15, less 1% discount.
- July 21. Received the interest due from JR Stutts and a new 60-day, 9% note as a renewal of the loan of June 21. (Record both the debit and the credit to the notes receivable account.)
- Sept.19. Received from JR Stutts the amount due on her note of July 21.
  - 22. Sold merchandise on account to Wycoff Co., \$20,000. The cost of merchandise sold was \$12,000.
- Oct. 14. Accepted a 30-day, 6% note for \$20,000 from Wycoff Co. on account.
- Nov. 13. Wycoff Co. dishonored the note dated October 14.
- Dec. 28. Received from Wycoff Co. the amount owed on the dishonored note, plus interest for 45 days at 8% computed on the maturity value of the note.

#### **Instructions**

Journalize the entries to record the transactions.

General Ledger

# **Cases & Projects**



#### CP 8-1 Ethics and professional conduct in business

Bev Wynn, vice president of operations for Dillon County Bank, has instructed the bank's computer programmer to use a 365-day year to compute interest on depository accounts (liabilities). Bev also instructed the programmer to use a 360-day year to compute interest on loans (assets).

Discuss whether Bev is behaving in a professional manner.

#### **CP 8-2** Estimate uncollectible accounts

For several years, Xtreme Co.'s sales have been on a "cash only" basis. On January 1, 2013, however, Xtreme Co. began offering credit on terms of n/30. The amount of the adjusting entry to record the estimated uncollectible receivables at the end of each year has been  $\frac{1}{2}$  of 1% of credit sales, which is the rate reported as the average for the industry. Credit sales and the year-end credit balances in Allowance for Doubtful Accounts for the past four years are as follows:

Year	Credit Sales	Allowance for Doubtful Accounts
2013	\$4,000,000	\$ 5,000
2014	4,400,000	8,250
2015	4,800,000	10,200
2016	5.100.000	14.400

Laurie Jones, president of Xtreme Co., is concerned that the method used to account for and write off uncollectible receivables is unsatisfactory. She has asked for your advice in the analysis of past operations in this area and for recommendations for change.

- 1. Determine the amount of (a) the addition to Allowance for Doubtful Accounts and (b) the accounts written off for each of the four years.
- 2. a. Advise Laurie Jones as to whether the estimate of ½ of 1% of credit sales appears reasonable.
  - b. Assume that after discussing (a) with Laurie Jones, she asked you what action might be taken to determine what the balance of Allowance for Doubtful Accounts should be at December 31, 2016, and what possible changes, if any, you might recommend in accounting for uncollectible receivables. How would you respond?





#### CP 8-3 Accounts receivable turnover and days' sales in receivables

**Best Buy** is a specialty retailer of consumer electronics, including personal computers, entertainment software, and appliances. Best Buy operates retail stores in addition to the Best Buy, Media Play, On Cue, and Magnolia Hi-Fi Web sites. For two recent years, Best Buy reported the following (in millions):

	Year 2	Year 1
Sales	\$50,705	\$49,747
Accounts receivable at end of year	2,288	2,348

Assume that the accounts receivable (in millions) were \$2,020 at the beginning of fiscal Year 1.

- 1. Compute the accounts receivable turnover for Year 2 and Year 1. Round to one decimal place.
- 2. Compute the days' sales in receivables at the end of Year 2 and Year 1. Use 365 days and round to one decimal place.

- 3. What conclusions can be drawn from (1) and (2) regarding Best Buy's efficiency in collecting receivables?
- 4. What assumption did we make about sales for the Best Buy ratio computations that might distort the ratios and therefore cause the ratios not to be comparable for Year 2 and Year 1?

# . /



#### CP 8-4 Accounts receivable turnover and days' sales in receivables

Apple Inc. designs, manufactures, and markets personal computers and related personal computing and communicating solutions for sale primarily to education, creative, consumer, and business customers. Substantially all of the company's sales over the last five years are from sales of its Macs, iPods, iPads, and related software and peripherals. For two recent fiscal years, Apple reported the following (in millions):

	Year 2	Year 1
Sales	\$156,508	\$108,249
Accounts receivable at end of year	21,275	13,731

Assume that the accounts receivable (in millions) were \$11,560 at the beginning of fiscal Year 1.

- 1. Compute the accounts receivable turnover for Year 2 and Year 1. Round to one decimal place.
- 2. Compute the days' sales in receivables at the end of Year 2 and Year 1. Use 365 days and round to one decimal place.
- 3. What conclusions can be drawn from (1) and (2) regarding Apple's efficiency in collecting receivables?





#### CP 8-5 Accounts receivable turnover and days' sales in receivables

**Costco Wholesale Corporation** operates membership warehouses that sell a variety of branded and private label products. Headquartered in Issaquah, Washington, it also sells merchandise online in the United States (Costco.com) and in Canada (Costco.ca). For two recent years, Costco reported the following (in millions):

	Year 2	Year 1
Sales	\$99,137	\$88,915
Accounts receivable at end of year	1 <i>.</i> 576	1,455

Assume that the accounts receivable (in thousands) were \$1,321 at the beginning of Year 1.

- 1. Compute the accounts receivable turnover for Year 2 and Year 1. Round to one decimal place.
- 2. Compute the days' sales in receivables at the end of Year 2 and Year 1. Use 365 days and round to one decimal place.
- 3. What conclusions can be drawn from (1) and (2) regarding Costco's efficiency in collecting receivables?
- 4. Given the nature of Costco's operations, do you believe Costco's accounts receivable turnover ratio would be higher or lower than a typical manufacturing company, such as H.J. Heinz Company? Explain.





#### CP 8-6 Accounts receivable turnover

The accounts receivable turnover ratio will vary across companies, depending on the nature of the company's operations. For example, an accounts receivable turnover of 6 for a retailer is unacceptable but might be excellent for a manufacturer of specialty milling equipment. A list of well-known companies follows:

Alcoa Inc. The Coca-Cola Company Kroger

AutoZone, Inc. Delta Air Lines Procter & Gamble

Barnes & Noble, Inc. The Home Depot Walmart

Caterpillar IBM Whirlpool Corporation

- 1. Categorize each of the preceding companies as to whether its turnover ratio is likely to be above or below 15.
- 2. Based on (1), identify a characteristic of companies with accounts receivable turnover ratios above 15.



# Fixed Assets and Intangible Assets

# McDonald's

**cDonald's** began in 1940 in San Bernardino, California, as a Bar-B-Q restaurant operated by two brothers, Dick and Mac McDonald. In 1954, Ray Kroc visited the restaurant and convinced the McDonald brothers to let him franchise its operations nationwide. Ray Kroc opened his first McDonald's in Des Plaines, Illinois, in 1955, with its distinguishing, newly designed Golden Arches. Today, McDonald's operates in 119 countries, has more than 34,000 restaurants, employs more than 400,000 people, has sold more than 250 billion hamburgers, and generates yearly revenues in excess of \$27.5 billion.

Would you like to own and operate a McDonald's restaurant? McDonald's grants twenty-year franchises to individuals who want to become owner/operators of a restaurant. Individuals may purchase either an existing or a new restaurant. When opening a new restaurant, the owner must invest in the store equipment, signs, seating, and décor. The company normally owns the land and the building. McDonald's also provides

training for its owner/operators. In return, the company is paid a monthly service charge, which is either a fixed amount or a percent of sales. The total cost of opening a new restaurant may exceed several million dollars.

Obviously, the decision to open a McDonald's restaurant is a major commitment with long-lasting implications. This chapter discusses the accounting for investments in long-term, fixed assets such as a new restaurant. This accounting addresses such issues as how much of the investment should be recorded as an asset, how much should be written off as an expense each year, and how the disposal of a fixed asset should be recorded. Finally, accounting for natural resources, such as mineral deposits, and intangible assets, such as patents and copyrights, are discussed.

Source: http://www.aboutmcdonalds.com

	Learning Objectives	
After stu	udying this chapter, you should be able to:	Example Exercises
OBJ 1	Define, classify, and account for the cost of fixed assets.  Nature of Fixed Assets Classifying Costs The Cost of Fixed Assets Capital and Revenue Expenditures Leasing Fixed Assets	<b>EE</b> 9-1
(2)	Compute depreciation, using the following methods: straight-line method, units-of-output method, and double-declining-balance method.  Accounting for Depreciation Factors in Computing Depreciation Expense Straight-Line Method Units-of-Output Method Double-Declining-Balance Method Comparing Depreciation Methods Depreciation for Federal Income Tax Revising Depreciation Estimates	EE 9-2 EE 9-3 EE 9-4
(3)	Journalize entries for the disposal of fixed assets. Disposal of Fixed Assets Discarding Fixed Assets Selling Fixed Assets	<b>EE</b> 9-6
OBJ 4	Compute depletion and journalize the entry for depletion. Natural Resources	<b>EE</b> 9-7
OBJ 5	Describe the accounting for intangible assets, such as patents, copyrights, and goodwill.  Intangible Assets Patents Copyrights and Trademarks	<b>EE</b> 9-8
	Goodwill	EE 9-8
OBJ 6	Describe how depreciation expense is reported in an income statement and prepare a balance sheet that includes fixed assets and intangible assets. Financial Reporting for Fixed Assets and Intangible Assets	
ORJ 7	Describe and illustrate the fixed asset turnover ratio to assess the efficiency of a company's use of its fixed assets. Financial Analysis and Interpretation: Fixed Asset Turnover Ratio	<b>EE</b> 9-9
		At a Glance 9 Page 434



# **Nature of Fixed Assets**

**Fixed assets** are long-term or relatively permanent assets such as equipment, machinery, buildings, and land. Other descriptive titles for fixed assets are *plant assets* or *property, plant, and equipment*. Fixed assets have the following characteristics:

- They exist physically and, thus, are tangible assets.
- They are owned and used by the company in its normal operations.
- They are not offered for sale as part of normal operations.

Exhibit 1 shows the percent of fixed assets to total assets for some select companies. As shown in Exhibit 1, fixed assets are often a significant portion of the total assets of a company.

Fixed Assets of Tota			
Alcoa Inc	47%		
Exxon Mobil Corporation	68		
Ford Motor Company	22		
Kroger			
Office Depot Inc.	21		
United Parcel Service, Inc.	46		
Verizon Communications	39		
Walgreen Co	36		
Walmart	58		

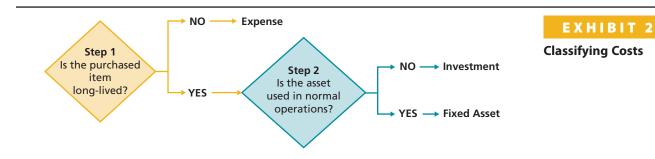
#### **EXHIBIT 1**

Fixed Assets as a Percent of Total Assets—Selected Companies

# **Classifying Costs**

A cost that has been incurred may be classified as a fixed asset, an investment, or an expense. Exhibit 2 shows how to determine the proper classification of a cost and how it should be recorded.





As shown in Exhibit 2, classifying a cost involves the following steps:

- Step 1. Is the purchased item long-lived?

  If *yes*, the item is recorded as an asset on the balance sheet, either as a fixed asset or an investment. Proceed to Step 2.
  - If no, the item is classified and recorded as an expense.
- Step 2. Is the asset used in normal operations?
   If yes, the asset is classified and recorded as a fixed asset.
   If no, the asset is classified and recorded as an investment.

Items that are classified and recorded as fixed assets include land, buildings, or equipment. Such assets normally last more than a year and are used in the normal operations. However, standby equipment for use during peak periods or when other equipment breaks down is still classified as a fixed asset, even though it is not used very often. In contrast, fixed assets that have been abandoned or are no longer used in operations are not classified as fixed assets.

Although fixed assets may be sold, they should not be offered for sale as part of normal operations. For example, cars and trucks offered for sale by an automotive dealership are not fixed assets of the dealership. On the other hand, a tow truck used in the normal operations of the dealership is a fixed asset of the dealership.

Investments are long-lived assets that are not used in the normal operations and are held for future resale. Such assets are reported on the balance sheet in a section

entitled *Investments*. For example, undeveloped land acquired for future resale would be classified and reported as an investment, not land.

#### The Cost of Fixed Assets

In addition to purchase price, the costs of acquiring fixed assets include all amounts spent getting the asset in place and ready for use. For example, freight costs and the costs of installing equipment are part of the asset's total cost.

Exhibit 3 summarizes some of the common costs of acquiring fixed assets. These costs are recorded by debiting the related fixed asset account, such as Land,¹ Building, Land Improvements, or Machinery and Equipment.

#### **EXHIBIT 3**

#### **Costs of Acquiring Fixed Assets**

#### Building Machinery & Equipment Land · Architects' fees Sales taxes · Purchase price Freight · Sales taxes Engineers' fees · Insurance costs incurred during Installation · Permits from government agencies construction · Repairs (purchase of used equipment) · Broker's commissions Interest on money borrowed to finance . Reconditioning (purchase of used · Title fees construction equipment) · Surveying fees · Sales taxes · Insurance while in transit Delinquent real estate taxes · Repairs (purchase of existing building) · Assembly · Removing unwanted · Reconditioning (purchase of existing · Modifying for use building less any salvage building) · Testing for use · Grading and leveling · Modifying for use · Permits from government agencies · Permits from government agencies Land Improvements Trees and shrubs Fences Outdoor lighting Paved parking areas or walkways

Only costs necessary for preparing the fixed asset for use are included as a cost of the asset. Unnecessary costs that do not increase the asset's usefulness are recorded as an expense. For example, the following costs are included as an expense:

- Vandalism
- Mistakes in installation
- Uninsured theft
- Damage during unpacking and installing
- Fines for not obtaining proper permits from governmental agencies

A company may incur costs associated with constructing a fixed asset such as a new building. The direct costs incurred in the construction, such as labor and

¹ As discussed here, land is assumed to be used only as a location or site and not for its mineral deposits or other natural resources.

materials, should be capitalized as a debit to an account entitled *Construction in Progress*. When the construction is complete, the costs are reclassified by crediting Construction in Progress and debiting the proper fixed asset account such as Building. For some companies, construction in progress can be significant.

# 35

Intel
Corporation
reported in a recent

annual report construction in progress of \$8.2 billion, which was 29% of its total fixed assets.

# IFRS

See Appendix C for more information.

# **Capital and Revenue Expenditures**

Once a fixed asset has been acquired and placed into service, costs may be incurred for ordinary maintenance and repairs. In addition, costs may be incurred for improving an asset or for extraordinary repairs that extend the asset's useful life. Costs that benefit only the current period are called **revenue expenditures**. Costs that improve the asset or extend its useful life are **capital expenditures**.

**Ordinary Maintenance and Repairs** Costs related to the ordinary maintenance and repairs of a fixed asset are recorded as an expense of the current period. Such expenditures are *revenue expenditures* and are recorded as increases to Repairs and Maintenance Expense. For example, \$300 paid for a tune-up of a delivery truck is recorded as follows:

	Repairs and Maintenance Expense  Cash	300	300	

**Asset Improvements** After a fixed asset has been placed into service, costs may be incurred to improve the asset. For example, the service value of a delivery truck might be improved by adding a \$5,500 hydraulic lift to allow for easier and quicker loading of cargo. Such costs are *capital expenditures* and are recorded as increases to the fixed asset account. In the case of the hydraulic lift, the expenditure is recorded as follows:

Delivery Truck 5 Cash	5,500
-----------------------	-------

Because the cost of the delivery truck has increased, depreciation for the truck will also change over its remaining useful life.

**Extraordinary Repairs** After a fixed asset has been placed into service, costs may be incurred to extend the asset's useful life. For example, the engine of a forklift that is near the end of its useful life may be overhauled at a cost of \$4,500, extending its useful life by eight years. Such costs are *capital expenditures* and are recorded as a decrease in an accumulated depreciation account. In the case of the forklift, the expenditure is recorded as follows:

Accumulated Depreciation—Forklift  Cash	4,500	4,500	
-----------------------------------------	-------	-------	--

Because the forklift's remaining useful life has changed, depreciation for the forklift will also change based on the new book value of the forklift.

# Integrity, Objectivity, and Ethics in Business

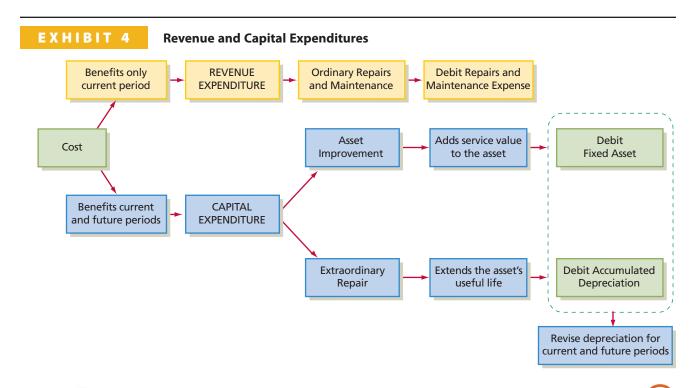


#### **CAPITAL CRIME**

One of the largest alleged accounting frauds in history involved the improper accounting for capital expenditures. WorldCom, the second largest telecommunications company in the United States at the time, improperly treated maintenance expenditures on its telecommunications

network as capital expenditures. As a result, the company had to restate its prior years' earnings downward by nearly \$4 billion to correct this error. The company declared bankruptcy within months of disclosing the error, and the CEO was sentenced to 25 years in prison.

The accounting for revenue and capital expenditures is summarized in Exhibit 4.



# Example Exercise 9-1 Capital and Revenue Expenditures



On June 18, GTS Co. paid \$1,200 to upgrade a hydraulic lift and \$45 for an oil change for one of its delivery trucks. Journalize the entries for the hydraulic lift upgrade and oil change expenditures.

Follow My Example 9-1				
June 18	Delivery Truck	1,200	1,200	
18	Repairs and Maintenance Expense	45	45	

Practice Exercises: PE 9-1A, PE 9-1B

# **Leasing Fixed Assets**

A *lease* is a contract for the use of an asset for a period of time. Leases are often used in business. For example, automobiles, computers, medical equipment, buildings, and airplanes are often leased.

The two parties to a lease contract are as follows:

- The *lessor* is the party who owns the asset.
- The *lessee* is the party to whom the rights to use the asset are granted by the lessor.

Under a lease contract, the lessee pays rent on a periodic basis for the lease term. An advantage of leasing an asset is that the lessee has access to an asset without having to spend funds or obtain financing to buy the asset. In addition, expenses such as maintenance and repair costs may be the responsibility of the lessor. Finally, the risk of incurring additional cost because the asset becomes obsolete before the end of its useful life can be mitigated by leasing an asset.

The accounting for leases is currently the focus of a joint project by the Financial Accounting Standards (FASB) and the International Accounting Standards Board (IASB) to





merge U.S. and international standards.² Under the proposed standard lessors and lessees would be required to record assets and liabilities related to certain long-term lease contracts.

For purposes of this text, we assume that leases are short-term and not extending beyond one year. Thus, lease payments are recorded as rent by debiting Rent Expense and crediting Cash. The lease terms, such as a renewal option, may be disclosed in the notes to the financial statements. The asset rentals described in the earlier chapters of this text were accounted for in this manner.

# **Accounting for Depreciation**

Over time, fixed assets, with the exception of land, lose their ability to provide services. Thus, the costs of fixed assets such as equipment and buildings should be recorded as an expense over their useful lives. This periodic recording of the cost of fixed assets as an expense is called **depreciation**. Because land has an unlimited life, it is not depreciated.

The adjusting entry to record depreciation debits Depreciation Expense and credits a contra asset account entitled *Accumulated Depreciation* or *Allowance for Depreciation*. The use of a contra asset account allows the original cost to remain unchanged in the fixed asset account.

Depreciation can be caused by physical or functional factors.

- Physical depreciation factors include wear and tear during use or from exposure to weather.
- Functional depreciation factors include obsolescence and changes in customer needs
  that cause the asset to no longer provide services for which it was intended. For example, equipment may become obsolete due to changing technology.

Two common misunderstandings that exist about depreciation as used in accounting include:

- Depreciation does not measure a decline in the market value of a fixed asset. Instead, depreciation is an allocation of a fixed asset's cost to expense over the asset's useful life. Thus, the book value of a fixed asset (cost less accumulated depreciation) usually does not agree with the asset's market value. This is justified in accounting because a fixed asset is for use in a company's operations rather than for resale.
- Depreciation does not provide cash to replace fixed assets as they wear out. This
  misunderstanding may occur because depreciation, unlike most expenses, does not
  require an outlay of cash when it is recorded.

# **Factors in Computing Depreciation Expense**

Three factors determine the depreciation expense for a fixed asset. These three factors are as follows:

- The asset's initial cost
- The asset's expected useful life
- The asset's estimated residual value

The initial *cost* of a fixed asset is determined using the concepts discussed and illustrated earlier in this chapter.

The *expected useful life* of a fixed asset is estimated at the time the asset is placed into service. Estimates of expected useful lives are available from industry trade associations. The Internal Revenue Service also publishes guidelines for useful lives, which may be helpful for financial reporting purposes. However, it is not uncommon for different companies to use a different useful life for similar assets.

The **residual value** of a fixed asset at the end of its useful life is estimated at the time the asset is placed into service. Residual value is sometimes referred to as *scrap value*, *salvage value*, or *trade-in value*. The difference between a fixed asset's initial cost



Compute depreciation,

using the following methods: straight-line method, units-of-output method, and doubledeclining-balance method.

#### Note:

The adjusting entry to record depreciation debits Depreciation Expense and credits Accumulated Depreciation.

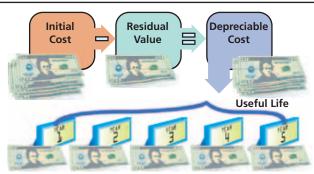
² Proposed Accounting Standards Update, *Leases (Topic 842)*, Financial Accounting Standards Board, May 16, 2013.

and its residual value is called the asset's *depreciable cost*. The depreciable cost is the amount of the asset's cost that is allocated over its useful life as depreciation expense. If a fixed asset has no residual value, then its entire cost should be allocated to depreciation.

Exhibit 5 shows the relationship between depreciation expense and a fixed asset's initial cost, expected useful life, and estimated residual value.

#### **EXHIBIT 5**

Depreciation Expense Factors



**Periodic Depreciation Expense** 

For an asset placed into or taken out of service during the first half of a month, many companies compute depreciation on the asset for the entire month. That is, the asset is treated as having been purchased or sold on the first day of *that* month. Likewise, purchases and sales during the second half of a month are treated as having occurred on the first day of the *next* month. To simplify, this practice is used in this chapter.

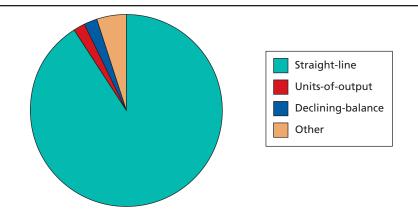
The three depreciation methods used most often are as follows:³

- Straight-line depreciation
- Units-of-output depreciation
- Double-declining-balance depreciation

Exhibit 6 shows how often these methods are used in financial statements.

#### EXHIBIT 6

Use of Depreciation Methods



Source: Accounting Trends & Techniques, 66th ed., American Institute of Certified Public Accountants, New York, 2012.

It is not necessary for a company to use only one method of computing depreciation for all of its fixed assets. For example, a company may use one method for depreciating equipment and another method for depreciating buildings. A company may also use different depreciation methods for determining income taxes and property taxes.

³ Another method not often used today, called the *sum-of-the-years-digits method*, is described and illustrated in an online appendix located at www.cengagebrain.com.

# **Straight-Line Method**

The **straight-line method** provides for the same amount of depreciation expense for each year of the asset's useful life. As shown in Exhibit 6, the straight-line method is by far the most widely used depreciation method.

To illustrate, assume that equipment was purchased on January 1 as follows:

Initial cost	\$24,000
Expected useful life	5 years
Estimated residual value	\$2.000

The annual straight-line depreciation of \$4,400 is computed as follows:

Annual Depreciation = 
$$\frac{\text{Cost} - \text{Residual Value}}{\text{Useful Life}} = \frac{\$24,000 - \$2,000}{5 \text{ Years}} = \$4,400$$

If an asset is used for only part of a year, the annual depreciation is prorated. For example, assume that the preceding equipment was purchased and placed into service on October 1. The depreciation for the year ending December 31 would be \$1,100, computed as follows:

First-Year Partial Depreciation = 
$$\$4,400 \times 3 \div 12 = \$1,100$$

The computation of straight-line depreciation may be simplified by converting the annual depreciation to a percentage of depreciable cost.⁴ The straight-line percentage is determined by dividing 100% by the number of years of expected useful life, computed as follows:

Expected Years	Straight-Line
of Useful Life	Percentage
5 years	20% (100% ÷ 5)
8 years	12.5% (100% ÷ 8)
10 years	10% (100% ÷ 10)
20 years	5% (100% ÷ 20)
25 years	4% (100% ÷ 25)

For the preceding equipment, the annual depreciation of \$4,400 can be computed by multiplying the depreciable cost of \$22,000 by 20% ( $100\% \div 5$ ).

The straight-line method is simple to use. When an asset's revenues are about the same from period to period, straight-line depreciation provides a good matching of depreciation expense with the asset's revenues.

# Example Exercise 9-2 Straight-Line Depreciation



Equipment acquired at the beginning of the year at a cost of \$125,000 has an estimated residual value of \$5,000 and an estimated useful life of 10 years. Determine (a) the depreciable cost, (b) the straight-line rate, and (c) the annual straight-line depreciation.

#### Follow My Example 9-2

- a. \$120,000 (\$125,000 \$5,000)
- b.  $10\% = 1 \div 10$
- c.  $$12,000 ($120,000 \times 10\%)$ , or  $($120,000 \div 10 \text{ years})$

Practice Exercises: PE 9-2A, PE 9-2B

⁴The depreciation rate may also be expressed as a fraction. For example, the annual straight-line rate for an asset with a three-year useful life is 1/3.

Norfolk

depreciates its train engines

based on hours of operation.

Southern

Corporation

# **Units-of-Output Method**

The units-of-output method provides the same amount of depreciation expense for each unit of output of the asset. Depending on the asset, the units of output can be expressed in terms of hours, miles driven, or quantity produced. For example, the unit of output for a truck is normally expressed in miles driven. For manufacturing assets, the units of output are often expressed as units of product. In this case, the units-of-output method may be called the *units-of-production method*.

The units-of-output method is applied in the following two steps:

• Step 1. Determine the depreciation per unit as follows:

• Step 2. Compute the depreciation expense as follows:

Depreciation Expense = Depreciation per Unit × Total Units of Output Used

To illustrate, assume that the equipment in the preceding example is expected to have a useful life of 10,000 operating hours. During the year, the equipment was operated 2,100 hours. The units-of-output depreciation for the year is \$4,620, computed as follows:

• Step 1. Determine the depreciation per hour as follows:

Depreciation per Hour = 
$$\frac{\text{Cost} - \text{Residual Value}}{\text{Total Units of Output}} = \frac{\$24,000 - \$2,000}{10,000 \text{ Hours}} = \$2.20 \text{ per Hour}$$

• Step 2. Compute the depreciation expense as follows:

Depreciation Expense = Depreciation per Unit  $\times$  Total Units of Output Used Depreciation Expense = \$2.20 per Hour  $\times$  2,100 Hours = \$4,620

The units-of-output method is often used when a fixed asset's in-service time (or use) varies from year to year. In such cases, the units-of-output method matches depreciation expense with the asset's revenues.

# Example Exercise 9-3 Units-of-Output Depreciation



Equipment acquired at the beginning of the year at a cost of \$180,000 has an estimated residual value of \$10,000, has an estimated useful life of 40,000 hours, and was operated 3,600 hours during the year. Determine (a) the depreciable cost, (b) the depreciation rate, and (c) the unit-of-output depreciation for the year.

#### Follow My Example 9-3

- a. \$170,000 (\$180,000 \$10,000)
- b. \$4.25 per hour (\$170,000 ÷ 40,000 hours)
- c. \$15,300 (3,600 hours × \$4.25)

Practice Exercises: PE 9-3A, PE 9-3B

# **Double-Declining-Balance Method**

The **double-declining-balance method** provides for a declining periodic expense over the expected useful life of the asset. The double-declining-balance method is applied in the following three steps:

- Step 1. Determine the straight-line percentage, using the expected useful life.
- Step 2. Determine the double-declining-balance rate by multiplying the straight-line rate from Step 1 by 2.
- Step 3. Compute the depreciation expense by multiplying the double-declining-balance rate from Step 2 times the book value of the asset.

To illustrate, the equipment purchased in the preceding example is used to compute double-declining-balance depreciation. For the first year, the depreciation is \$9,600, computed as follows:

- Step 1. Straight-line percentage = 20% (100% ÷ 5)
- Step 2. Double-declining-balance rate = 40% (20%  $\times$  2)
- Step 3. Depreciation expense =  $\$9,600 \ (\$24,000 \times 40\%)$

For the first year, the book value of the equipment is its initial cost of \$24,000. After the first year, the **book value** (cost minus accumulated depreciation) declines, and thus, the depreciation also declines. The double-declining-balance depreciation for the full five-year life of the equipment is as follows:

Year	Cost	Acc. Dep. at Beginning of Year	Book Value at Beginning of Year		Double- Declining- Balance Rate	Depreciation for Year	Book Value at End of Year
1	\$24,000		\$24,000.00	×	40%	\$9,600.00	\$14,400.00
2	24,000	\$ 9,600.00	14,400.00	×	40%	5,760.00	8,640.00
3	24,000	15,360.00	8,640.00	×	40%	3,456.00	5,184.00
4	24,000	18,816.00	5,184.00	×	40%	2,073.60	3,110.40
5	24,000	20,889.60	3,110.40		_	1,110.40	2,000.00

When the double-declining-balance method is used, the estimated residual value is *not* considered. However, the asset should not be depreciated below its estimated residual value. In the preceding example, the estimated residual value was \$2,000. Therefore, the depreciation for the fifth year is \$1,110.40 (\$3,110.40 - \$2,000.00) instead of  $$1,244.16 (40\% \times $3,110.40)$ .

Like straight-line depreciation, if an asset is used for only part of a year, the annual depreciation is prorated. For example, assume that the preceding equipment was purchased and placed into service on October 1. The depreciation for the year ending December 31 would be \$2,400, computed as follows:

First-Year Partial Depreciation =  $$9,600 \times 3 \div 12 = $2,400$ 

The depreciation for the second year would then be \$8,640, computed as follows:

Second-Year Depreciation =  $\$8,640 = [40\% \times (\$24,000 - \$2,400)]$ 

The double-declining-balance method provides a higher depreciation in the first year of the asset's use, followed by declining depreciation amounts. For this reason, the double-declining-balance method is called an **accelerated depreciation method**.

An asset's revenues are often greater in the early years of its use than in later years. In such cases, the double-declining-balance method provides a good matching of depreciation expense with the asset's revenues.

### Example Exercise 9-4 Double-Declining-Balance Depreciation



Equipment acquired at the beginning of the year at a cost of \$125,000 has an estimated residual value of \$5,000 and an estimated useful life of 10 years. Determine (a) the double-declining-balance rate and (b) the double-declining-balance depreciation for the first year.

#### Follow My Example 9-4

- a.  $20\% [(1 \div 10) \times 2]$
- b.  $$25,000 ($125,000 \times 20\%)$

Practice Exercises: PE 9-4A, PE 9-4B

# **Comparing Depreciation Methods**

The three depreciation methods are summarized in Exhibit 7. All three methods allocate a portion of the total cost of an asset to an accounting period, while never depreciating an asset below its residual value.

#### **EXHIBIT 7**

Summary of Depreciation Methods

Method	Useful Life	Depreciable Cost	Depreciation Rate	Depreciation Expense
Straight-line	Years	Cost less residual value	Straight-line rate*	Constant
Units-of- output	Total units of output	Cost less residual value	Cost – Residual value Total units of output	Variable
Double- declining-balance	Years	Declining book value, but not below residual value	Straight-line rate* × 2	Declining
*Straight-line rate = (1	00% ÷ Useful life)			

The straight-line method provides for the same periodic amounts of depreciation expense over the life of the asset. The units-of-output method provides for periodic amounts of depreciation expense that vary, depending on the amount the asset is used. The double-declining-balance method provides for a higher depreciation amount in the first year of the asset's use, followed by declining amounts.

The depreciation for the straight-line, units-of-output, and double-declining-balance methods is shown in Exhibit 8. The depreciation in Exhibit 8 is based on the equipment purchased in our prior illustrations. For the units-of-output method, we assume that the equipment was used as follows:

Year 1	2,100 hours
Year 2	1,500
Year 3	2,600
Year 4	1,800
Year 5	2,000
Total	10,000 hours

ng-Balance od
$000 \times 40\%$
$400 \times 40\%$
$40 \times 40\%$ )
84 × 40%)

#### **EXHIBIT 8**

#### Comparing Depreciation Methods



### **Depreciation for Federal Income Tax**

The Internal Revenue Code uses the Modified Accelerated Cost Recovery System (MACRS) to compute depreciation for tax purposes. MACRS has eight classes of useful life and depreciation rates for each class. Two of the most common classes are the five-year class and the seven-year class.⁵ The five-year class includes automobiles and light-duty trucks. The seven-year class includes most machinery and equipment. Depreciation for these two classes is similar to that computed using the double-declining-balance method.

In using the MACRS rates, residual value is ignored. Also, all fixed assets are assumed to be put in and taken out of service in the middle of the year. For the five-year-class assets, depreciation is spread over six years, as illustrated in Exhibit 9.

Year	MACRS Five-Year-Class Depreciation Rates
1	20.0%
2	32.0
3	19.2
4	11.5
5	11.5
6	5.8
	100.0%

#### **EXHIBIT 9**

**MACRS Depreciation Rates for 5-Year-Class** Assets

To simplify, a company will sometimes use MACRS for both financial statement and tax purposes. This is acceptable if MACRS does not result in significantly different amounts than would have been reported using one of the three depreciation methods discussed in this chapter.



# Business **Connection**

#### **DEPRECIATING ANIMALS?**

Under MACRS, various farm animals may be depreciated. The period (years) over which some common classes of farm animals may be depreciated are shown in the table that follows.

Depreciation for farm animals begins when the animal reaches the age of maturity, which is normally when it can be worked, milked, or bred. For race horses, depreciation begins when a horse is put into training.

Class of Animal	Years
Dairy or breeding cattle	7–10
Goats and sheep	5
Hogs	3
Horses	3–12

⁵ Real estate is in either a 27½-year or a 31½-year class and is depreciated by the straight-line method.

# **Revising Depreciation Estimates**

Estimates of residual values and useful lives of fixed assets may change due to abnormal wear and tear or obsolescence. When new estimates are determined, they are used to determine the depreciation expense in future periods. The depreciation expense recorded in earlier years is not affected.⁶

To illustrate, assume the following data for a machine that was purchased on January 1, 2015:

Initial machine cost	\$140,000
Expected useful life	5 years
Estimated residual value	\$10,000
Annual depreciation using the straight-line method	
$[(\$140,000 - \$10,000) \div 5 \text{ years}]$	\$26,000

At the end of 2016, the machine's book value (undepreciated cost) is \$88,000, computed as follows:

Initial machine cost	\$140,000
Less accumulated depreciation (\$26,000 per year $\times$ 2 years)	52,000
Book value (undepreciated cost), end of second year	\$ 88,000

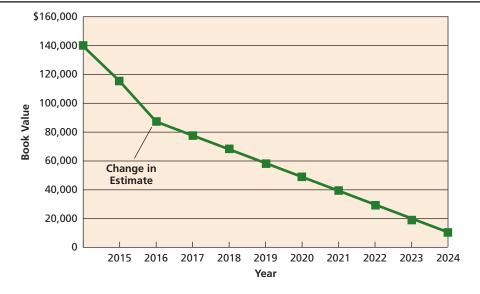
At the beginning of 2017, the company estimates that the machine's remaining useful life is eight years (instead of three) and that its residual value is \$8,000 (instead of \$10,000). The depreciation expense for each of the remaining eight years is \$10,000, computed as follows:

Book value (undepreciated cost), end of second year	\$88,000
Less revised estimated residual value	8,000
Revised remaining depreciable cost	\$80,000
Revised annual depreciation expense	
[(\$88,000 – \$8,000) ÷ 8 years]	\$10,000

Exhibit 10 shows the book value of the asset over its original and revised lives. After the depreciation is revised at the end of 2016, book value declines at a slower rate. At the end of year 2024, the book value reaches the revised residual value of \$8,000.

#### **EXHIBIT 10**

Book Value of Asset with Change in Estimate



⁶ FASB Accounting Standards Codification, Section 250-10-05.

# Example Exercise 9-5 Revision of Depreciation

OBJ 2

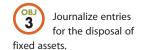
A warehouse with a cost of \$500,000 has an estimated residual value of \$120,000, has an estimated useful life of 40 years, and is depreciated by the straight-line method. (a) Determine the amount of the annual depreciation. (b) Determine the book value at the end of the twentieth year of use. (c) Assuming that at the start of the twenty-first year the remaining life is estimated to be 25 years and the residual value is estimated to be \$150,000, determine the depreciation expense for each of the remaining 25 years.

#### Follow My Example 9-5

- a. \$9,500 [(\$500,000 \$120,000) ÷ 40]
- b.  $\$310,000 \ [\$500,000 (\$9,500 \times 20)]$
- c.  $$6,400 [($310,000 $150,000) \div 25]$

Practice Exercises: PE 9-5A, PE 9-5B

# **Disposal of Fixed Assets**



Fixed assets that are no longer useful may be discarded or sold.⁷ In such cases, the fixed asset is removed from the accounts. Just because a fixed asset is fully depreciated, however, does not mean that it should be removed from the accounts.

If a fixed asset is still being used, its cost and accumulated depreciation should remain in the ledger even if the asset is fully depreciated. This maintains accountability for the asset in the ledger. If the asset was removed from the ledger, the accounts would contain no evidence of the continued existence of the asset. In addition, cost and accumulated depreciation data on such assets are often needed for property tax and income tax reports.

# **Discarding Fixed Assets**

If a fixed asset is no longer used and has no residual value, it is discarded. For example, assume that a fixed asset that is fully depreciated and has no residual value is discarded. The entry to record the discarding removes the asset and its related accumulated depreciation from the ledger.

To illustrate, assume that equipment acquired at a cost of \$25,000 is fully depreciated at December 31, 2015. On February 14, 2016, the equipment is discarded. The entry to record the discard is as follows:

Feb. 14 Accumulated Depreciation—Equipment Equipment To write off equipment discarded.	25,000	25,000	
----------------------------------------------------------------------------------------	--------	--------	--

If an asset has not been fully depreciated, depreciation should be recorded before removing the asset from the accounting records. To illustrate, assume that equipment costing \$6,000 with no estimated residual value is depreciated at a straight-line rate of 10%. On December 31, 2015, the accumulated depreciation balance, after adjusting entries, is \$4,650. On March 24, 2016, the asset is removed from service and discarded. The entry to record the depreciation for the three months of 2016 before the asset is discarded is as follows:

|--|

⁷The accounting for the exchange of fixed assets is described and illustrated in the appendix at the end of this chapter.

#### Note:

The entry to record the disposal of a fixed asset removes the cost of the asset and its accumulated depreciation from the accounts.

The o	discarding	of the	equipment	is	then	recorded	as follows:	
-------	------------	--------	-----------	----	------	----------	-------------	--

Mar. 24 Accumulated Depreciation—Equipment Loss on Disposal of Equipment Equipment To write off equipment discarded.	4,800 1,200	6,000
Equipment	1,200	6,000

The loss of \$1,200 is recorded because the balance of the accumulated depreciation account (\$4,800) is less than the balance in the equipment account (\$6,000). Losses on the discarding of fixed assets are reported in the income statement.

# **Selling Fixed Assets**

The entry to record the sale of a fixed asset is similar to the entry for discarding an asset. The only difference is that the receipt of cash is also recorded. If the selling price is more than the book value of the asset, a gain is recorded. If the selling price is less than the book value, a loss is recorded.

To illustrate, assume that equipment is purchased at a cost of \$10,000 with no estimated residual value and is depreciated at a straight-line rate of 10%. The equipment is sold for cash on October 12 of the eighth year of its use. The balance of the accumulated depreciation account as of the preceding December 31 is \$7,000. The entry to update the depreciation for the nine months of the current year is as follows:

_					
Oct.	12	Depreciation Expense—Equipment	750		
		Accumulated Depreciation—Equipment		750	
		To record current depreciation on			
		equipment sold (\$10,000 $\times \frac{9}{12} \times 10\%$ ).			

After the current depreciation is recorded, the book value of the asset is \$2,250 (\$10,000 - \$7,750). The entries to record the sale, assuming three different selling prices, are as follows:

Sold at book value, for \$2,250. No gain or loss.

Oct.	12	Cash Accumulated Depreciation—Equipment	2,250 7,750		
		Equipment		10,000	

Sold below book value, for \$1,000. Loss of \$1,250.

Oct.	12	Cash	1,000		
		Accumulated Depreciation—Equipment	7,750		
		Loss on Sale of Equipment	1,250		
		Equipment		10,000	

Sold above book value, for \$2,800. Gain of \$550.

Oct. 12	Cash Accumulated Depreciation—Equipment	2,800 7,750		
	Equipment Gain on Sale of Equipment	,	10,000 550	

# Example Exercise 9-6 Sale of Equipment



Equipment was acquired at the beginning of the year at a cost of \$91,000. The equipment was depreciated using the straight-line method based on an estimated useful life of nine years and an estimated residual value of \$10,000.

- a. What was the depreciation for the first year?
- b. Assuming the equipment was sold at the end of the second year for \$78,000, determine the gain or loss on the sale of the equipment.
- c. Journalize the entry to record the sale.

#### Dynamic Exhibit

### Follow My Example 9-6

- a.  $$9,000 [($91,000 $10,000) \div 9]$
- b.  $5,000 \text{ gain } \{578,000 [$91,000 ($9,000 \times 2)]\}$

c.	Cash	78,000
	Accumulated Depreciation—Equipment	18,000
	Equipment	

Practice Exercises: PE 9-6A, PE 9-6B

# **Natural Resources**



The fixed assets of some companies include timber, metal ores, minerals, or other natural resources. As these resources are harvested or mined and then sold, a portion of their cost is debited to an expense account. This process of transferring the cost of natural resources to an expense account is called **depletion**.

Depletion is determined as follows:8

• Step 1. Determine the depletion rate as follows:

Depletion Rate = 
$$\frac{\text{Cost of Resource}}{\text{Estimated Total Units of Resource}}$$

 Step 2. Multiply the depletion rate by the quantity extracted from the resource during the period.

Depletion Expense = Depletion Rate × Quantity Extracted

To illustrate, assume that Karst Company purchased mining rights as follows:

Cost of mineral deposit \$400,000
Estimated total units of resource 1,000,000 tons
Tons mined during year 90,000 tons

The depletion expense of \$36,000 for the year is computed as follows:

Step 1. Depletion Rate = 
$$\frac{\text{Cost of Resource}}{\text{Estimated Total Units of Resource}} = \frac{\$400,000}{1,000,000 \text{ Tons}} = \$0.40 \text{ per Ton}$$

Step 2. Depletion Expense =  $$0.40 \text{ per Ton} \times 90,000 \text{ Tons} = $36,000$ 

The adjusting entry to record the depletion is as follows:

	Dec. 31	Depletion Expense Accumulated Depletion Depletion of mineral deposit.		36,000	36,000	
--	---------	-----------------------------------------------------------------------	--	--------	--------	--

⁸ We assume that there is no significant residual value after all the natural resource is extracted.

Like the accumulated depreciation account, Accumulated Depletion is a contra asset account. It is reported on the balance sheet as a deduction from the cost of the mineral deposit.

#### Example Exercise 9-7 Depletion



Earth's Treasures Mining Co. acquired mineral rights for \$45,000,000. The mineral deposit is estimated at 50,000,000 tons. During the current year, 12,600,000 tons were mined and sold.

- a. Determine the depletion rate.
- b. Determine the amount of depletion expense for the current year.
- c. Journalize the adjusting entry on December 31 to recognize the depletion expense.

#### Follow My Example 9-7

- a. \$0.90 per ton (\$45,000,000 ÷ 50,000,000 tons)
- b.  $$11,340,000 (12,600,000 tons \times $0.90 per ton)$

Practice Exercises: PE 9-7A, PE 9-7B



# **Intangible Assets**

Patents, copyrights, trademarks, and goodwill are long-lived assets that are used in the operations of a business and are not held for sale. These assets are called **intangible assets** because they do not exist physically.

The accounting for intangible assets is similar to that for fixed assets. The major issues are:

- IFRS
- See Appendix C for more information.
- Determining the initial cost.
- Determining the amortization, which is the amount of cost to transfer to expense.

Amortization results from the passage of time or a decline in the usefulness of the intangible asset.

#### **Patents**

Manufacturers may acquire exclusive rights to produce and sell goods with one or more unique features. Such rights are granted by **patents**, which the federal government issues to inventors. These rights continue in effect for 20 years. A business may purchase patent rights from others, or it may obtain patents developed by its own research and development.

The initial cost of a purchased patent, including any legal fees, is debited to an asset account. This cost is written off, or amortized, over the years of the patent's expected useful life. The expected useful life of a patent may be less than its legal life. For example, a patent may become worthless due to changing technology or consumer tastes.

Patent amortization is normally computed using the straight-line method. The amortization is recorded by debiting an amortization expense account and crediting the patents account. A separate contra asset account is usually *not* used for intangible assets.

To illustrate, assume that at the beginning of its fiscal year, a company acquires patent rights for \$100,000. Although the patent will not expire for 14 years, its remaining useful life is estimated as five years. The adjusting entry to amortize the patent at the end of the year is as follows:

Dec. 31	Amortization Expense—Patents Patents Patent amortization (\$100,000 ÷ 5).	20,000	20,000	
			20,000	

Some companies develop their own patents through research and development. In such cases, any research and development costs are usually recorded as current operating expenses in the period in which they are incurred. This accounting for research and development costs is justified on the basis that any future benefits from research and development are highly uncertain.

# International **33** Connection



# IFRS INTERNATIONAL FINANCIAL **REPORTING STANDARDS (IFRS)**

IFRS allow certain research and development (R&D) costs to be recorded as assets when incurred. Typically, R&D costs are classified as either research costs or development costs. If certain criteria are met, research costs can be recorded as an expense, while development costs can be recorded as an asset. This criterion includes such considerations as the company's intent to use or to sell the intangible asset. For example, Nokia Corporation (Finland) reported capitalized development costs of €40 million in a recent statement of financial position (balance sheet), where € represents the euro, the common currency of the European Economic Union.*

*Differences between U.S. GAAP and IFRS are further discussed and illustrated in Appendix C.

### Copyrights and Trademarks

The exclusive right to publish and sell a literary, artistic, or musical composition is granted by a copyright. Copyrights are issued by the federal government and extend for 70 years beyond the author's death. The costs of a copyright include all costs of creating the work plus any other costs of obtaining the copyright. A copyright that is purchased is recorded at the price paid for it. Copyrights are amortized over their estimated useful lives.

A trademark is a name, term, or symbol used to identify a business and its products. Most businesses identify their trademarks with ® in their advertisements and on their products.

Under federal law, businesses can protect their trademarks by registering them for 10 years and renewing the registration for 10-year periods. Like a copyright, the legal costs of registering a trademark are recorded as an asset.

If a trademark is purchased from another business, its cost is recorded as an asset. In such cases, the cost of the trademark is considered to have an indefinite useful life. Thus, trademarks are not amortized. Instead, trademarks are reviewed periodically for impaired value. When a trademark is impaired, the trademark should be written down and a loss recognized.

#### Goodwill

Goodwill refers to an intangible asset of a business that is created from such favorable factors as location, product quality, reputation, and managerial skill. Goodwill allows a business to earn a greater rate of return than normal.

Generally accepted accounting principles (GAAP) allow goodwill to be recorded only if it is objectively determined by a transaction. An example of such a transaction is the purchase of a business at a price in excess of the fair value of its net assets (assets liabilities). The excess is recorded as goodwill and reported as an intangible asset.

Unlike patents and copyrights, goodwill is not amortized. However, a loss should be recorded if the future prospects of the purchased firm become impaired. This loss would normally be disclosed in the Other Expense section of the income statement.

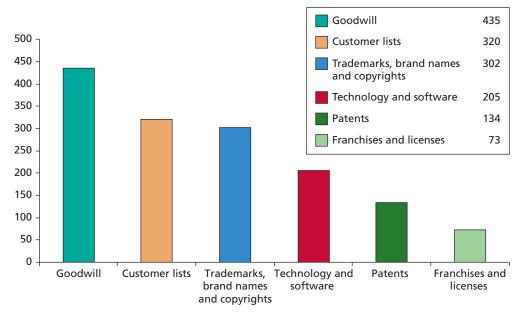
To illustrate, assume that on December 31 FaceCard Company has determined that \$250,000 of the goodwill created from the purchase of Electronic Systems is impaired. The entry to record the impairment is as follows:



Exhibit 11 shows common intangible asset disclosures for 500 large firms. Goodwill is the most often reported intangible asset. This is because goodwill arises from merger transactions, which are common.

#### EXHIBIT 11

Frequency of Intangible Asset Disclosures for 500 Firms



Note: Some firms have multiple disclosures.

Source: Accounting Trends & Techniques, 66th ed., American Institute of Certified Public Accountants, New York, 2012.

Exhibit 12 summarizes the characteristics of intangible assets.

### EXHIBIT 12

Comparison of Intangible Assets

Intangible Asset	Description	Amortization Period	Periodic Expense
Patent	Exclusive right to benefit from an innovation	Estimated useful life not to exceed legal life	Amortization expense
Copyright	Exclusive right to benefit from a literary, artistic, or musical composition	Estimated useful life not to exceed legal life	Amortization expense
Trademark	Exclusive use of a name, term, or symbol	None	Impairment loss if fair value less than carrying value (impaired)
Goodwill	Excess of purchase price of a business over the fair value of its net assets (assets — liabilities)	None	Impairment loss if fair value less than carrying value (impaired)

# Example Exercise 9-8 Impaired Goodwill and Amortization of Patent



On December 31, it was estimated that goodwill of \$40,000 was impaired. In addition, a patent with an estimated useful economic life of 12 years was acquired for \$84,000 on July 1.

- a. Journalize the adjusting entry on December 31 for the impaired goodwill.
- b. Journalize the adjusting entry on December 31 for the amortization of the patent rights.

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a. Dec. 31	Loss from Impaired Goodwill	40,000	40,000	
b. Dec. 31	Amortization Expense—Patents	3,500		
	Patents		3,500	
	Amortized patent rights [( $\$84,000 \div 12$ ) × (6 ÷ 12)].			
• • • • • • • • • • • • • • • • • • • •				

Practice Exercises: PE 9-8A, PE 9-8B

# Financial Reporting for Fixed Assets and Intangible Assets

In the income statement, depreciation and amortization expense should be reported separately or disclosed in a note. A description of the methods used in computing depreciation should also be reported.

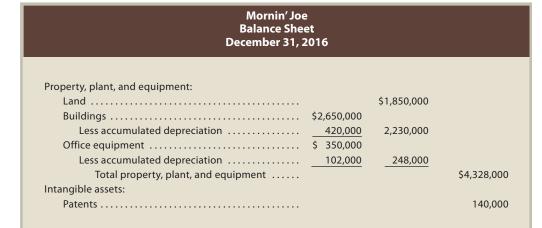
In the balance sheet, each class of fixed assets should be disclosed on the face of the statement or in the notes. The related accumulated depreciation should also be disclosed, either by class or in total. The fixed assets may be shown at their *book value* (cost less accumulated depreciation), which can also be described as their *net* amount.

If there are many classes of fixed assets, a single amount may be presented in the balance sheet, supported by a note with a separate listing. Fixed assets may be reported under the more descriptive caption of property, plant, and equipment.

Intangible assets are usually reported in the balance sheet in a separate section following fixed assets. The balance of each class of intangible assets should be disclosed net of any amortization.

The balance sheet presentation for **Mornin' Joe**'s fixed and intangible assets follows:







The cost and related accumulated depletion of mineral rights are normally shown as part of the Fixed Assets section of the balance sheet. The mineral rights may be shown net of depletion on the face of the balance sheet. In such cases, a supporting note discloses the accumulated depletion.

Describe and illustrate the fixed asset turnover ratio to assess the efficiency of a company's use of its fixed assets.



# **Financial Analysis and Interpretation: Fixed Asset Turnover Ratio**

A measure of a company's efficiency in using its fixed assets to generate revenue is the fixed asset turnover ratio. The fixed asset turnover ratio measures the number of dollars of sales earned per dollar of fixed assets. It is computed as follows:

Fixed Asset Turnover Ratio = 
$$\frac{\text{Sales}}{\text{Average Book Value of Fixed Assets}}$$

To illustrate, the following data (in millions) were taken from recent financial statements of Starbucks Corporation:

	Year 2	Year 1
Sales	\$13,300	\$11,700
Fixed assets (net):		
Beginning of year	2,355	2,417
End of year	2,659	2,355

Starbucks' fixed asset turnover ratios for Year 2 and Year 1 are computed as follows:

	Year 2	Year 1
Sales	\$13,300	\$11,700
Average fixed assets	\$2,507	\$2,386
	$[(\$2,355 + \$2,659) \div 2]$	[(\$2,417 + \$2,355) ÷ 2]
Fixed asset turnover ratio*	5.31	4.90
	(\$13,300 ÷ \$2,507)	(\$11,700 ÷ \$2,386)
46 1 1 1 1 1 1 1 1 1		

Rounded to two decimal places.



# Business Connection

#### **HUB-AND-SPOKE OR POINT-TO-POINT?**

Southwest Airlines Co. uses a simple fare structure, featuring low, unrestricted, unlimited, everyday coach fares. These fares are made possible by Southwest's use of a point-to-point, rather than a hub-and-spoke, business approach.

United Airlines, Inc., Delta Air Lines, and American Airlines employ a hub-and-spoke approach in which an airline establishes major hubs that serve as connecting links to other cities. For example, Delta has major connecting hubs in Atlanta and Salt Lake City.

In contrast, Southwest focuses on nonstop, point-topoint service between selected cities. As a result, Southwest minimizes connections, delays, and total trip time. This operating approach permits Southwest to achieve high utilization of its fixed assets, such as its 737 aircraft.

The higher the fixed asset turnover, the more efficiently a company is using its fixed assets in generating sales. For example, in Year 2 Starbucks earned \$5.31 of sales for every dollar of fixed assets, which is more than \$4.90 of sales for every dollar of fixed assets it earned in Year 1. Thus, Starbucks used its fixed assets more efficiently in Year 2.

As illustrated for Starbucks, the fixed asset turnover ratio can be compared across time for a single company. In addition, the ratio can be compared across companies. For example, the fixed asset turnover ratio for a number of different companies and industries is shown in Exhibit 13.

Company (industry)	Fixed Asso Turnove Ratio
Comcast Corporation (cable)	2.38
Google (Internet)	4.68
Manpower Inc. (temporary employment)	115.10
Norfolk Southern Corporation (railroad)	0.44
Ruby Tuesday, Inc. (restaurant)	1.33
Southwest Airlines Co. (airline)	1.37

#### **EXHIBIT 13**

Fixed Asset Turnover Ratio Examples

The smaller ratios are associated with companies that require large fixed asset investments. The larger fixed asset turnover ratios are associated with firms that are more labor intensive and require smaller fixed asset investments.

# **Example Exercise 9-9** Fixed Asset Turnover Ratio



Financial statement data for years ending December 31 for Broadwater Company follows:

	2016	2015
Sales	\$2,862,000	\$2,025,000
Fixed assets:		
Beginning of year	750,000	600,000
End of year	840,000	750,000

- a. Determine the fixed asset turnover ratio for 2016 and 2015.
- b. Does the change in the fixed asset turnover ratio from 2015 to 2016 indicate a favorable or an unfavorable trend?

#### Follow My Example 9-9

a. Fixed asset turnover:

	2016	2015
Sales	\$2,862,000	\$2,025,000
Fixed assets:		
Beginning of year	\$750,000	\$600,000
End of year	\$840,000	\$750,000
Average fixed assets	\$795,000	\$675,000
	$[(\$750,000 + \$840,000) \div 2]$	$[(\$600,000 + \$750,000) \div 2]$
Fixed asset turnover	3.6	3.0
	(\$2,862,000 ÷ \$795,000)	(\$2,025,000 ÷ \$675,000)

b. The increase in the fixed asset turnover ratio from 3.0 to 3.6 indicates a favorable trend in the efficiency of using fixed assets to generate sales.

Practice Exercises: PE 9-9A, PE 9-9B

# A P P E N D I X

# **Exchanging Similar Fixed Assets**

Old equipment is often traded in for new equipment having a similar use. In such cases, the seller allows the buyer an amount for the old equipment traded in. This amount, called the **trade-in allowance**, may be either greater or less than the book value of the old equipment. The remaining balance—the amount owed—is either paid in cash or recorded as a liability. It is normally called **boot**, which is its tax name.

Accounting for the exchange of similar assets depends on whether the transaction has *commercial substance*. An exchange has commercial substance if future cash flows change as a result of the exchange. If an exchange of similar assets has commercial substance, a gain or loss is recognized. In such cases, the exchange is accounted for similar to that of a sale of a fixed asset. The gain or loss is determined as the difference between the fair market value (trade-in allowance) of the asset given up (exchanged) and its book value. Alternatively, the gain or loss can be determined as the difference between the fair market value of the new asset received and the assets given up in the exchange (cash and book value of the old asset).

### **Gain on Exchange**

To illustrate a gain on an exchange of similar assets, assume the following:

Similar	equipment	t acquired	t (new):
Drico (fai	" ma a wl. a +	luo) of nov	

Price (fair market value) of new equipment	\$5,000
Trade-in allowance on old equipment	1,100
Cash paid at June 19, date of exchange	\$3,900
Equipment traded in (old):	
Cost of old equipment	\$4,000
Accumulated depreciation at date of exchange	3,200

800

The entry to record this exchange and payment of cash is as follows:

Book value at June 19, date of exchange.....

June 19	Accumulated Depreciation—Equipment	3,200	
	Equipment (new equipment)	5,000	
	Equipment (old equipment)		4,000
	Cash		3,900
	Gain on Exchange of Equipment		300

The gain on the exchange, \$300, is the difference between the fair market value (trade-in allowance) of the asset given up (exchanged) of \$1,100 and its book value of \$800, computed as follows:

Fair market value (trade-in allowance) of old equipment	\$1,100
Less book value of old equipment	800
Gain on exchange of assets	\$ 300

⁹ FASB Accounting Standards Codification, Section 360-10-30.

The gain on the exchange, \$300, can also be determined as the difference between the fair market value of the new asset of \$5,000 and the book value of the old asset traded in of \$800 plus the cash paid of \$3,900, computed as follows:

Price (fair market value) of new equipment		\$5,000
Less assets given up in exchange:		
Book value of old equipment (\$4,000 – \$3,200)	\$ 800	
Cash paid on the exchange	3,900	4,700
Gain on exchange of assets		\$ 300

# **Loss on Exchange**

To illustrate a loss on an exchange of similar assets, assume that instead of a trade-in allowance of \$1,100, a trade-in allowance of only \$675 was allowed in the preceding example. In this case, the cash paid on the exchange is \$4,325, computed as follows:

Price (fair market value) of new equipment	\$5,000
Trade-in allowance of old equipment	675
Cash paid at June 19, date of exchange	\$4,325

The entry to record this exchange and payment of cash is as follows:

June 19	Accumulated Depreciation—Equipment	3,200	
	Equipment (new equipment)	5,000	
	Loss on Exchange of Equipment	125	
	Equipment (old equipment)		4,000
	Cash		4,325

The loss on the exchange, \$125, is the difference between the fair market value (trade-in allowance) of the asset given up (exchanged) of \$675 and its book value of \$800, computed as follows:

Fair market value (trade-in allowance) of old equipment	\$ 675
Less book value of old equipment	800
Loss on exchange of assets	\$(125)

The loss on the exchange, \$125, can also be determined as the difference between the fair market value of the new asset of \$5,000 and the book value of the old asset traded in of \$800 plus the cash paid of \$4,325, computed as follows:

Price (fair market value) of new equipment		\$5,000
Less assets given up in exchange:		
Book value of old equipment (\$4,000 – \$3,200)	\$ 800	
Cash paid on the exchange	4,325	5,125
Loss on exchange of assets		\$ (125)

In those cases where an asset exchange *lacks commercial substance*, no gain is recognized on the exchange. Instead, the cost of the new asset is adjusted for any gain. For example, in the first illustration, the gain of \$300 would be subtracted from the purchase price of \$5,000 and the new asset would be recorded at \$4,700. Accounting for the exchange of assets that lack commercial substance is discussed in more advanced accounting texts.¹⁰

¹⁰ The exchange of similar assets also involves complex tax issues which are discussed in advanced accounting courses.

# At a Glance 9



#### Define, classify, and account for the cost of fixed assets.

**Key Points** Fixed assets are long-term tangible assets used in the normal operations of the business such as equipment, buildings, and land. The initial cost of a fixed asset includes all amounts spent to get the asset in place and ready for use. Revenue expenditures include ordinary repairs and maintenance. Capital expenditures include asset improvements and extraordinary repairs.

Learning Outcomes	Example Exercises	Practice Exercises	
• Define fixed assets.			
• List the types of costs that should be included in the cost of a fixed asset.			
<ul> <li>Provide examples of ordinary repairs, asset improvements, and extraordinary repairs.</li> </ul>			
<ul> <li>Prepare journal entries for ordinary repairs, asset improvements, and extraordinary repairs.</li> </ul>	EE9-1	PE9-1A, 9-1B	



Compute depreciation, using the following methods: straight-line method, units-of-output method, and double-declining-balance method.

**Key Points** All fixed assets except land should be depreciated over time. Three factors are considered in determining depreciation: (1) the fixed asset's initial cost, (2) the useful life of the asset, and (3) the residual value of the asset.

Depreciation may be determined using the straight-line, units-of-output, and double-declining-balance methods. Depreciation may be revised into the future for changes in an asset's useful life or residual value.

Learning Outcomes	Example Exercises	Practice Exercises
• Define and describe depreciation.		
• List the factors used in determining depreciation.		
Compute straight-line depreciation.	EE9-2	PE9-2A, 9-2B
• Compute units-of-output depreciation.	EE9-3	PE9-3A, 9-3B
Compute double-declining-balance depreciation.	EE9-4	PE9-4A, 9-4B
<ul> <li>Compute revised depreciation for a change in an asset's useful life and residual value.</li> </ul>	EE9-5	PE9-5A, 9-5B



#### Journalize entries for the disposal of fixed assets.

**Key Points** When discarding a fixed asset, any depreciation for the current period should be recorded, and the book value of the asset is then removed from the accounts.

When a fixed asset is sold, the book value is removed, and the cash or other asset received is recorded. If the selling price is more than the book value of the asset, the transaction results in a gain. If the selling price is less than the book value, there is a loss.

Learning Outcomes	Example Exercises	Practice Exercises
• Prepare the journal entry for discarding a fixed asset.		
• Prepare journal entries for the sale of a fixed asset.	EE9-6	PE9-6A, 9-6B



## Compute depletion and journalize the entry for depletion.

**Key Points** The amount of periodic depletion is computed by multiplying the quantity of minerals extracted during the period by a depletion rate. The depletion rate is computed by dividing the cost of the mineral deposit by its estimated total units of resource. The entry to record depletion debits a depletion expense account and credits an accumulated depletion account.

Learning Outcomes	Example Exercises	Practice Exercises
• Define and describe depletion.		
Compute a depletion rate.	EE9-7	PE9-7A, 9-7B
Prepare the journal entry to record depletion.	EE9-7	PE9-7A, 9-7B



## Describe the accounting for intangible assets, such as patents, copyrights, and goodwill.

**Key Points** Long-term assets such as patents, copyrights, trademarks, and goodwill are intangible assets. The cost of patents and copyrights should be amortized over the years of the asset's expected usefulness by debiting an expense account and crediting the intangible asset account. Trademarks and goodwill are not amortized but are written down only upon impairment.

Learning Outcomes	Example Exercises	Practice Exercises
• Define, describe, and provide examples of intangible assets.		
• Prepare a journal entry for the purchase of an intangible asset.		
<ul> <li>Prepare a journal entry to amortize the costs of patents and copyrights.</li> </ul>	EE9-8	PE9-8A, 9-8B
• Prepare the journal entry to record the impairment of goodwill.	EE9-8	PE9-8A, 9-8B



Describe how depreciation expense is reported in an income statement and prepare a balance sheet that includes fixed assets and intangible assets.

**Key Points** The amount of depreciation expense and the depreciation methods used should be disclosed in the financial statements. Each major class of fixed assets should be disclosed, along with the related accumulated depreciation. Intangible assets are usually presented in a separate section following fixed assets. Each major class of intangible assets should be disclosed net of the amortization recorded to date.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe and illustrate how fixed assets are reported on the income statement and balance sheet.</li> </ul>		
Describe and illustrate how intangible assets are reported on the income statement and balance sheet.		



Describe and illustrate the fixed asset turnover ratio to assess the efficiency of a company's use of its fixed assets.

**Key Points** A measure of a company's efficiency in using its fixed assets to generate sales is the fixed asset turnover ratio. The fixed asset turnover ratio measures the number of dollars of sales earned per dollar of fixed assets and is computed by dividing sales by the average book value of fixed assets.

<ul> <li>Learning Outcomes</li> <li>Describe a measure of the efficiency of a company's use of fixed assets to generate revenue.</li> <li>Compute and interpret the fixed asset turnover ratio.</li> </ul>	Example Exercises EE9-9	Practice Exercises PE9-9A, 9-9B
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# **Key Terms**

accelerated depreciation method (419) amortization (426) book value (419) boot (432) capital expenditures (413) copyright (427) depletion (425) depreciation (415) double-declining-balance method (419) fixed asset turnover ratio (430) fixed assets (410) goodwill (427) intangible assets (426) patents (426) residual value (415) revenue expenditures (413) straight-line method (417) trade-in allowance (432) trademark (427) units-of-output method (418)

## **Illustrative Problem**

McCollum Company, a furniture wholesaler, acquired new equipment at a cost of \$150,000 at the beginning of the fiscal year. The equipment has an estimated life of five years and an estimated residual value of \$12,000. Ellen McCollum, the president, has requested information regarding alternative depreciation methods.

## **Instructions**

- 1. Determine the annual depreciation for each of the five years of estimated useful life of the equipment, the accumulated depreciation at the end of each year, and the book value of the equipment at the end of each year by (a) the straight-line method and (b) the double-declining-balance method.
- 2. Assume that the equipment was depreciated under the double-declining-balance method. In the first week of the fifth year, the equipment was sold for \$10,000. Journalize the entry to record the sale.

## **Solution**

1.

	Year	Depreciation Expense	Accumulated Depreciation, End of Year	Book Value, End of Year
a.	1	\$27,600*	\$ 27,600	\$122,400
	2	27,600	55,200	94,800
	3	27,600	82,800	67,200
	4	27,600	110,400	39,600
	5	27,600	138,000	12,000

 $*$27,600 = ($150,000 - $12,000) \div 5$ 

b.	1	\$60,000**	\$ 60,000	\$90,000
	2	36,000	96,000	54,000
	3	21,600	117,600	32,400
	4	12,960	130,560	19,440
	5	7.440***	138,000	12.000

^{**\$60,000 = \$150,000 × 40%} 

2.

Cash	10,000		
Accumulated Depreciation—Equipment	130,560		
Loss on Sale of Equipment	9,440		
Equipment		150,000	

## **Discussion Questions**

- 1. O'Neil Office Supplies has a fleet of automobiles and trucks for use by salespersons and for delivery of office supplies and equipment. Collins Auto Sales Co. has automobiles and trucks for sale. Under what caption would the automobiles and trucks be reported in the balance sheet of (a) O'Neil Office Supplies and (b) Collins Auto Sales Co.?
- 2. Bullwinkle Co. acquired an adjacent vacant lot with the hope of selling it in the future at a gain. The lot is not intended to be used in Bullwinkle business operations. Where should such real estate be listed in the balance sheet?
- 3. Alpine Company solicited bids from several contractors to construct an addition to its office building. The lowest bid received was for \$1,200,000. Alpine Company decided to construct the addition itself at a cost of \$1,100,000. What amount should be recorded in the building account?
- 4. Distinguish between the accounting for capital expenditures and revenue expenditures.
- 5. Immediately after a used truck is acquired, a new motor is installed at a total cost of \$3,850. Is this a capital expenditure or a revenue expenditure?
- 6. Keyser Company purchased a machine that has a manufacturer's suggested life of 20 years. The company plans to use the machine on a special project

- that will last 12 years. At the completion of the project, the machine will be sold. Over how many years should the machine be depreciated?
- 7. Is it necessary for a business to use the same method of computing depreciation (a) for all classes of its depreciable assets and (b) for financial statement purposes and in determining income taxes?
- 8. a. Under what conditions is the use of an accelerated depreciation method most appropriate?
  - b. Why is an accelerated depreciation method often used for income tax purposes?
  - c. What is the Modified Accelerated Cost Recovery System (MACRS), and under what conditions is it used?
- 9. For some of the fixed assets of a business, the balance in Accumulated Depreciation is exactly equal to the cost of the asset. (a) Is it permissible to record additional depreciation on the assets if they are still useful to the business? Explain. (b) When should an entry be made to remove the cost and the accumulated depreciation from the accounts?
- 10. a. Over what period of time should the cost of a patent acquired by purchase be amortized?
  - b. In general, what is the required accounting treatment for research and development costs?
  - c. How should goodwill be amortized?

^{***}The asset is not depreciated below the estimated residual value of \$12,000 \$7,440 = \$150,000 - \$130,560 - \$12,000

## **Practice Exercises**

#### **EE 9-1** p. 414

## **PE 9-1A** Capital and revenue expenditures

OBJ. 1



On August 7, Green River Inflatables Co. paid \$1,675 to install a hydraulic lift and \$40 for an air filter for one of its delivery trucks. Journalize the entries for the new lift and air filter expenditures.

## **EE 9-1** p. 414

#### PE 9-1B Capital and revenue expenditures

OBJ. 1



On February 14, Garcia Associates Co. paid \$2,300 to repair the transmission on one of its delivery vans. In addition, Garcia Associates paid \$450 to install a GPS system in its van. Journalize the entries for the transmission and GPS system expenditures.

## **EE 9-2** p. 417

## PE 9-2A Straight-line depreciation

OBJ. 2



Equipment acquired at the beginning of the year at a cost of \$340,000 has an estimated residual value of \$45,000 and an estimated useful life of 10 years. Determine (a) the depreciable cost, (b) the straight-line rate, and (c) the annual straight-line depreciation.

## **EE 9-2** p. 417

## PE 9-2B Straight-line depreciation

OBJ. 2



A building acquired at the beginning of the year at a cost of \$1,450,000 has an estimated residual value of \$300,000 and an estimated useful life of 10 years. Determine (a) the depreciable cost, (b) the straight-line rate, and (c) the annual straight-line depreciation.

#### **EE 9-3** p. 418

## PE 9-3A Units-of-output depreciation

OBJ. 2



A tractor acquired at a cost of \$420,000 has an estimated residual value of \$30,000, has an estimated useful life of 25,000 hours, and was operated 1,850 hours during the year. Determine (a) the depreciable cost, (b) the depreciation rate, and (c) the units-of-output depreciation for the year.

## **EE 9-3** p. 418

## PE 9-3B Units-of-output depreciation

OBJ. 2



A truck acquired at a cost of \$69,000 has an estimated residual value of \$12,000, has an estimated useful life of 300,000 miles, and was driven 77,000 miles during the year. Determine (a) the depreciable cost, (b) the depreciation rate, and (c) the units-of-output depreciation for the year.

## **EE 9-4** p. 420

## PE 9-4A Double-declining-balance depreciation

OBJ. 2



Equipment acquired at the beginning of the year at a cost of \$175,000 has an estimated residual value of \$12,000 and an estimated useful life of 10 years. Determine (a) the double-declining-balance rate and (b) the double-declining-balance depreciation for the first year.

## **EE 9-4** p. 420

## **PE 9-4B** Double-declining-balance depreciation

OBJ. 2



A building acquired at the beginning of the year at a cost of \$1,375,000 has an estimated residual value of \$250,000 and an estimated useful life of 40 years. Determine (a) the double-declining-balance rate and (b) the double-declining-balance depreciation for the first year.

## **EE 9-5** p. 423

## PE 9-5A Revision of depreciation

OBJ. 2



A truck with a cost of \$82,000 has an estimated residual value of \$16,000, has an estimated useful life of 12 years, and is depreciated by the straight-line method. (a) Determine the amount of the annual depreciation. (b) Determine the book value at the end of the seventh year of use. (c) Assuming that at the start of the eighth year the remaining life is estimated to be six years and the residual value is estimated to be \$12,000, determine the depreciation expense for each of the remaining six years.

#### **EE 9-5** p. 423

## PE 9-5B Revision of depreciation

OBJ. 2



Equipment with a cost of \$180,000 has an estimated residual value of \$14,400, has an estimated useful life of 16 years, and is depreciated by the straight-line method. (a) Determine the amount of the annual depreciation. (b) Determine the book value at the end of the tenth year of use. (c) Assuming that at the start of the eleventh year the remaining life is estimated to be eight years and the residual value is estimated to be \$10,500, determine the depreciation expense for each of the remaining eight years.

#### **EE 9-6** p. 425

#### PE 9-6A Sale of equipment

OBJ. 3



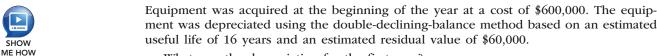
Equipment was acquired at the beginning of the year at a cost of \$465,000. The equipment was depreciated using the straight-line method based on an estimated useful life of 15 years and an estimated residual value of \$45,000.

- a. What was the depreciation for the first year?
- b. Assuming the equipment was sold at the end of the eighth year for \$235,000, determine the gain or loss on the sale of the equipment.
- c. Journalize the entry to record the sale.

#### **EE 9-6** p. 425

## PE 9-6B Sale of equipment

OBJ. 3

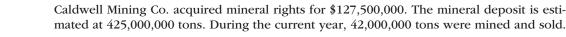


- a. What was the depreciation for the first year?
- b. Assuming the equipment was sold at the end of the second year for \$480,000, determine the gain or loss on the sale of the equipment.
- c. Journalize the entry to record the sale.

## **EE 9-7** p. 426

## PE 9-7A Depletion

OBJ. 4



- a. Determine the depletion rate.
- b. Determine the amount of depletion expense for the current year.
- c. Journalize the adjusting entry on December 31 to recognize the depletion expense.

## **EE 9-7** p. 426

#### PE 9-7B Depletion

OBJ. 4



SHOW

ME HOW

Glacier Mining Co. acquired mineral rights for \$494,000,000. The mineral deposit is estimated at 475,000,000 tons. During the current year, 31,500,000 tons were mined and sold.

- a. Determine the depletion rate.
- b. Determine the amount of depletion expense for the current year.
- c. Journalize the adjusting entry on December 31 to recognize the depletion expense.

## **EE 9-8** p. 429

## PE 9-8A Impaired goodwill and amortization of patent

OBJ. 5

On December 31, it was estimated that goodwill of \$4,000,000 was impaired. In addition, a patent with an estimated useful economic life of 15 years was acquired for \$900,000 on August 1.

- a. Journalize the adjusting entry on December 31 for the impaired goodwill.
- b. Journalize the adjusting entry on December 31 for the amortization of the patent rights.

#### **EE 9-8** p. 429

## PE 9-8B Impaired goodwill and amortization of patent

OBJ. 5

On December 31, it was estimated that goodwill of \$6,000,000 was impaired. In addition, a patent with an estimated useful economic life of 12 years was acquired for \$1,500,000 on April 1.

- a. Journalize the adjusting entry on December 31 for the impaired goodwill.
- b. Journalize the adjusting entry on December 31 for the amortization of the patent rights.

#### **EE 9-9** p. 431

## PE 9-9A Fixed asset turnover ratio

**OBJ. 7** 

Financial statement data for years ending December 31 for DePuy Company follows:

ME HOW

	2016	2015
Sales	\$5,510,000	\$4,880,000
Fixed assets:		
Beginning of year	1,600,000	1,450,000
End of year	2,200,000	1,600,000

- a. Determine the fixed asset turnover ratio for 2016 and 2015.
- b. Does the change in the fixed asset turnover ratio from 2015 to 2016 indicate a favorable or an unfavorable trend?

#### **EE 9-9** p. 431

## PE 9-9B Fixed asset turnover ratio

**OBJ. 7** 

Financial statement data for years ending December 31 for Davenport Company follows:



	2016	2015
Sales	\$1,668,000	\$1,125,000
Fixed assets:		
Beginning of year	670,000	580,000
End of year	720,000	670,000

- a. Determine the fixed asset turnover ratio for 2016 and 2015.
- b. Does the change in the fixed asset turnover ratio from 2015 to 2016 indicate a favorable or an unfavorable trend?

## Exercises

## EX 9-1 Costs of acquiring fixed assets

OBJ. 1

Melinda Stoffers owns and operates ABC Print Co. During February, ABC Print Co. incurred the following costs in acquiring two printing presses. One printing press was new, and the other was bought from a business that recently filed for bankruptcy.

Costs related to new printing press:

- 1. Fee paid to factory representative for installation
- 2. Freight
- 3. Insurance while in transit
- 4. New parts to replace those damaged in unloading

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- 5. Sales tax on purchase price
- 6. Special foundation

Costs related to used printing press:

- 7. Fees paid to attorney to review purchase agreement
- 8. Freight
- 9. Installation
- 10. Repair of damage incurred in reconditioning the press
- 11. Replacement of worn-out parts
- 12. Vandalism repairs during installation
- a. Indicate which costs incurred in acquiring the new printing press should be debited to the asset account.
- b. Indicate which costs incurred in acquiring the used printing press should be debited to the asset account.

## EX 9-2 Determining cost of land

OBJ. 1

Bridger Ski Co. has developed a tract of land into a ski resort. The company has cut the trees, cleared and graded the land and hills, and constructed ski lifts. (a) Should the tree cutting, land clearing, and grading costs of constructing the ski slopes be debited to the land account? (b) If such costs are debited to Land, should they be depreciated?

## EX 9-3 Determining cost of land

OBJ, 1

Northwest Delivery Company acquired an adjacent lot to construct a new warehouse, paying \$75,000 and giving a short-term note for \$90,000. Legal fees paid were \$2,500, delinquent taxes assumed were \$22,400, and fees paid to remove an old building from the land were \$14,500. Materials salvaged from the demolition of the building were sold for \$7,500. A contractor was paid \$660,000 to construct a new warehouse. Determine the cost of the land to be reported on the balance sheet.

#### EX 9-4 Capital and revenue expenditures

OBJ. 1

Warner Freight Lines Co. incurred the following costs related to trucks and vans used in operating its delivery service:

- 1. Changed the oil and greased the joints of all the trucks and vans.
- 2. Changed the radiator fluid on a truck that had been in service for the past four years.
- 3. Installed a hydraulic lift to a van.
- 4. Installed security systems on four of the newer trucks.
- 5. Overhauled the engine on one of the trucks purchased three years ago.
- 6. Rebuilt the transmission on one of the vans that had been driven 40,000 miles. The van was no longer under warranty.
- 7. Removed a two-way radio from one of the trucks and installed a new radio with a greater range of communication.
- 8. Repaired a flat tire on one of the vans.
- 9. Replaced a truck's suspension system with a new suspension system that allows for the delivery of heavier loads.
- 10. Tinted the back and side windows of one of the vans to discourage theft of contents.

Classify each of the costs as a capital expenditure or a revenue expenditure.

**✓** \$196,900



## EX 9-5 Capital and revenue expenditures

OBJ. 1

Jackie Fox owns and operates Platinum Transport Co. During the past year, Jackie incurred the following costs related to an 18-wheel truck:

- 1. Changed engine oil.
- 2. Installed a television in the sleeping compartment of the truck.
- 3. Installed a wind deflector on top of the cab to increase fuel mileage.
- 4. Modified the factory-installed turbo charger with a special-order kit designed to add 50 more horsepower to the engine performance.
- 5. Replaced a headlight that had burned out.
- 6. Replaced a shock absorber that had worn out.
- 7. Replaced fog and cab light bulbs.
- 8. Replaced the hydraulic brake system that had begun to fail during his latest trip through the Rocky Mountains.
- 9. Removed the old CB radio and replaced it with a newer model with a greater range.
- 10. Replaced the old radar detector with a newer model that is fastened to the truck with a locking device that prevents its removal.

Classify each of the costs as a capital expenditure or a revenue expenditure.

## **EX 9-6** Capital and revenue expenditures

OBJ. 1

Quality Move Company made the following expenditures on one of its delivery trucks:

Mar. 20. Replaced the transmission at a cost of \$1,890.

June 11. Paid \$1,350 for installation of a hydraulic lift.

Nov. 30. Paid \$55 to change the oil and air filter.

Prepare journal entries for each expenditure.

## EX 9-7 Nature of depreciation

OBJ. 2

Tri-City Ironworks Co. reported \$44,500,000 for equipment and \$29,800,000 for accumulated depreciation—equipment on its balance sheet.

Does this mean (a) that the replacement cost of the equipment is \$44,500,000 and (b) that \$29,800,000 is set aside in a special fund for the replacement of the equipment? Explain.

## **EX 9-8** Straight-line depreciation rates

OBJ. 2

Convert each of the following estimates of useful life to a straight-line depreciation rate, stated as a percentage: (a) 4 years, (b) 8 years, (c) 10 years, (d) 16 years, (e) 25 years, (f) 40 years, (g) 50 years.

## **EX 9-9** Straight-line depreciation

OBJ. 2

A refrigerator used by a meat processor has a cost of \$48,000, an estimated residual value of \$9,000, and an estimated useful life of 15 years. What is the amount of the annual depreciation computed by the straight-line method?

## EX 9-10 Depreciation by units-of-output method

OBJ. 2

A diesel-powered tractor with a cost of \$180,000 and estimated residual value of \$18,000 is expected to have a useful operating life of 36,000 hours. During February, the tractor was operated 156 hours. Determine the depreciation for the month.

SHOW ME HOW

**✓** c. 10%

**√** \$2,600



**✓** \$702



# EX 9-11 Depreciation by units-of-output method

#### OBJ. 2

✓ a. Truck #1, credit to Accumulated Depreciation, \$5,460



✓ a. \$4,800

√ a. \$3,250

SHOW

ME HOW

Prior to adjustment at the end of the year, the balance in Trucks is \$296,900 and the balance in Accumulated Depreciation—Trucks is \$99,740. Details of the subsidiary ledger are as follows:

Truck No.	Cost	Estimated Residual Value	Estimated Useful Life	Accumulated Depreciation at Beginning of Year	Miles Operated During Year
1	\$80,000	\$15,000	250,000 miles	_	21,000 miles
2	54,000	6,000	300,000	\$14,400	33,500
3	72,900	10,900	200,000	60,140	8,000
4	90,000	22,800	240,000	25,200	22,500

- a. Determine the depreciation rates per mile and the amount to be credited to the accumulated depreciation section of each of the subsidiary accounts for the miles operated during the current year.
- b. Journalize the entry to record depreciation for the year.

## **EX 9-12** Depreciation by two methods

OBJ. 2

A John Deere tractor acquired on January 4 at a cost of \$120,000 has an estimated useful life of 25 years. Assuming that it will have no residual value, determine the depreciation for each of the first two years (a) by the straight-line method and (b) by the doubledeclining-balance method.

## EX 9-13 Depreciation by two methods

OBJ. 2

A storage tank acquired at the beginning of the fiscal year at a cost of \$75,000 has an estimated residual value of \$10,000 and an estimated useful life of 20 years. Determine the following: (a) the amount of annual depreciation by the straight-line method and (b) the amount of depreciation for the first and second years computed by the doubledeclining-balance method.

OBJ. 2

EX 9-14 Partial-year depreciation Sandblasting equipment acquired at a cost of \$40,000 has an estimated residual value of \$8,000 and an estimated useful life of eight years. It was placed into service on April 1 of the current fiscal year, which ends on December 31. Determine the depreciation for the current fiscal year and for the following fiscal year by (a) the straight-line method and (b) the double-declining-balance method.

✓ a. First year, \$3,000



✓ a. \$23,750

✓ b. Depreciation Expense, \$800

## **EX 9-15** Revision of depreciation

OBJ. 2

A building with a cost of \$1,200,000 has an estimated residual value of \$250,000, has an estimated useful life of 40 years, and is depreciated by the straight-line method. (a) What is the amount of the annual depreciation? (b) What is the book value at the end of the twenty-eighth year of use? (c) If at the start of the twenty-ninth year it is estimated that the remaining life is 10 years and that the residual value is \$180,000 what is the depreciation expense for each of the remaining 10 years?

## EX 9-16 Capital expenditure and depreciation

OBJ. 1, 2

Willow Creek Company purchased and installed carpet in its new general offices on April 30 for a total cost of \$18,000. The carpet is estimated to have a 15-year useful life and no residual value.

- a. Prepare the journal entry necessary for recording the purchase of the new carpet.
- b. Record the December 31 adjusting entry for the partial-year depreciation expense for the carpet, assuming that Willow Creek Company uses the straight-line method.



## EX 9-17 Entries for sale of fixed asset

OBJ. 3

Equipment acquired on January 8, 2013, at a cost of \$140,000, has an estimated useful life of 16 years, has an estimated residual value of \$8,000, and is depreciated by the straight-line method.

- a. What was the book value of the equipment at December 31, 2016, the end of the year?
- b. Assuming that the equipment was sold on July 1, 2017, for \$96,700, journalize the entries to record (1) depreciation for the six months until the sale date, and (2) the sale of the equipment.

## **EX 9-18** Disposal of fixed asset

OBJ. 3

Equipment acquired on January 6, 2013, at a cost of \$425,000, has an estimated useful life of 16 years and an estimated residual value of \$65,000

- a. What was the annual amount of depreciation for the years 2013, 2014, and 2015 using the straight-line method of depreciation?
- b. What was the book value of the equipment on January 1, 2016?
- c. Assuming that the equipment was sold on January 3, 2016, for \$340,000, journalize the entry to record the sale.
- d. Assuming that the equipment had been sold on January 3, 2016, for \$372,500 instead of \$340,000, journalize the entry to record the sale.

## **EX 9-19** Depletion entries

OBJ. 4

Big Sky Mining Co. acquired mineral rights for \$42,000,000. The mineral deposit is estimated at 20,000,000 tons. During the current year, 1,850,000 tons were mined and sold.

- a. Determine the amount of depletion expense for the current year.
- b. Journalize the adjusting entry to recognize the depletion expense.

## **EX 9-20** Amortization entries

OBJ. 5

Smith Company acquired patent rights on January 6, 2013, for \$882,000. The patent has a useful life equal to its legal life of nine years. On January 3, 2016, Smith successfully defended the patent in a lawsuit at a cost of \$45,000.

- a. Determine the patent amortization expense for the year ended December 31, 2016.
- b. Journalize the adjusting entry to recognize the amortization.

## EX 9-21 Book value of fixed assets

OBJ. 6

Apple Inc. designs, manufactures, and markets personal computers and related software. Apple also manufactures and distributes music players (iPod) and mobile phones (iPhone) along with related accessories and services, including online distribution of third-party music, videos, and applications. The following information was taken from a recent annual report of Apple:

Property, Plant, and Equipment (in millions):

	Current Year	Preceding Year
Land and buildings	\$ 2,439	\$2,059
Machinery, equipment, and internal-use software	15,743	6,926
Office furniture and equipment	241	184
Other fixed assets related to leases	3,464	2,599
Accumulated depreciation and amortization	6,435	3,991

- a. Compute the book value of the fixed assets for the current year and the preceding year and explain the differences, if any.
- b. Would you normally expect Apple's book value of fixed assets to increase or decrease during the year?

✓ b. \$357,500



✓ a. \$3,885,000



✓ a. \$105,500



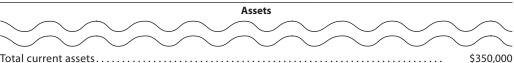
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## EX 9-22 Balance sheet presentation

OBJ. 6

List the errors you find in the following partial balance sheet:

Burnt Red Company Balance Sheet December 31, 2016



Replacement Cost	Accumulated Depreciation	Book Value
\$ 250,000	\$ 50,000	\$200,000
450,000	160,000	290,000
375,000	140,000	235,000
125,000	60,000	65,000
90,000	_	90,000
60,000	10,000	50,000
\$1,350,000	\$420,000	\$930,000
	\$ 250,000 450,000 375,000 125,000 90,000 60,000	Cost         Depreciation           \$ 250,000         \$ 50,000           450,000         160,000           375,000         140,000           125,000         60,000           90,000         —           60,000         10,000

## EX 9-23 Fixed asset turnover ratio

OBJ. 7





**Verizon Communications** is a major telecommunications company in the United States. Two recent balance sheets for Verizon disclosed the following information regarding fixed assets:

	Year 2 (in millions)	Year 1 (in millions)
Plant, property, and equipment	\$209,575	\$215,626
Less accumulated depreciation	120,933	127,192
	\$ 88,642	\$ 88,434

Verizon's revenue for Year 2 was \$115,846 million. Assume the fixed asset turnover for the telecommunications industry averages approximately 1.10.

- a. Determine Verizon's fixed asset turnover ratio for Year 2. Round to two decimal places.
- b. Interpret Verizon's fixed asset turnover ratio.

## EX 9-24 Fixed asset turnover ratio

OBJ. 7





The following table shows the revenue and average net fixed assets (in millions) for a recent fiscal year for Best Buy and RadioShack:

	Revenue	Average Net Fixed Assets
Best Buy	\$50,705	\$3,647
RadioShack	4,258	255

- a. Compute the fixed asset turnover for each company. Round to two decimal places.
- b. Which company uses its fixed assets more efficiently? Explain.

#### **Appendix**

## EX 9-25 Asset traded for similar asset

✓ a. \$185,000

A printing press priced at a fair market value of \$275,000 is acquired in a transaction that has commercial substance by trading in a similar press and paying cash for the difference between the trade-in allowance and the price of the new press.

- a. Assuming that the trade-in allowance is \$90,000, what is the amount of cash given?
- b. Assuming that the book value of the press traded in is \$68,000, what is the gain or loss on the exchange?

#### **Appendix**

## **EX 9-26** Asset traded for similar asset

**✓** b. \$18,500 loss

Assume the same facts as in Exercise 9-25, except that the book value of the press traded in is \$108,500. (a) What is the amount of cash given? (b) What is the gain or loss on the exchange?

#### **Appendix**

## EX 9-27 Entries for trade of fixed asset

On July 1, Twin Pines Co., a water distiller, acquired new bottling equipment with a list price (fair market value) of \$220,000. Twin Pines received a trade-in allowance (fair market value) of \$45,000 on the old equipment of a similar type and paid cash of \$175,000. The following information about the old equipment is obtained from the account in the equipment ledger: cost, \$180,000; accumulated depreciation on December 31, the end of the preceding fiscal year, \$120,000; annual depreciation, \$12,000. Assuming the exchange has commercial substance, journalize the entries to record (a) the current depreciation of the old equipment to the date of trade-in and (b) the exchange transaction on July 1.

## **Appendix**

## EX 9-28 Entries for trade of fixed asset

On October 1, Bentley Delivery Services acquired a new truck with a list price (fair market value) of \$75,000. Bentley Delivery received a trade-in allowance (fair market value) of \$24,000 on an old truck of similar type and paid cash of \$51,000. The following information about the old truck is obtained from the account in the equipment ledger: cost, \$56,000; accumulated depreciation on December 31, the end of the preceding fiscal year, \$35,000; annual depreciation, \$7,000. Assuming the exchange has commercial substance, journalize the entries to record (a) the current depreciation of the old truck to the date of trade-in and (b) the transaction on October 1.

## **Problems: Series A**

#### PR 9-1A Allocating payments and receipts to fixed asset accounts

OBJ. 1

✓ Land, \$400,000

The following payments and receipts are related to land, land improvements, and buildings acquired for use in a wholesale ceramic business. The receipts are identified by an asterisk.

a.	Fee paid to attorney for title search	\$ 2,500
b.	Cost of real estate acquired as a plant site: Land	285,000
	Building	55,000
c.	Delinquent real estate taxes on property, assumed by purchaser	15,500
d.	Cost of razing and removing building	5,000
e.	Proceeds from sale of salvage materials from old building	4,000*
f.	Special assessment paid to city for extension of water main to the property	29,000
g.	Architect's and engineer's fees for plans and supervision	60,000
h.	Premium on one-year insurance policy during construction	6,000
i.	Cost of filling and grading land	12,000
j.	Money borrowed to pay building contractor	900,000*
k.	Cost of repairing windstorm damage during construction	5,500
l.	Cost of paving parking lot to be used by customers	32,000
m.	Cost of trees and shrubbery planted	11,000
n.	Cost of floodlights installed on parking lot	2,000
o.	Cost of repairing vandalism damage during construction	2,500
p.	Proceeds from insurance company for windstorm and vandalism damage	7,500*
q.	Payment to building contractor for new building	800,000
r.	Interest incurred on building loan during construction	34,500
s.	Refund of premium on insurance policy (h) canceled after 11 months	500*

## **Instructions**

1. Assign each payment and receipt to Land (unlimited life), Land Improvements (limited life), Building, or Other Accounts. Indicate receipts by an asterisk. Identify each item by letter and list the amounts in columnar form, as follows:

		Land		Other
ltem	Land	Improvements	Building	Accounts

- 2. Determine the amount debited to Land, Land Improvements, and Building.
- 3. The costs assigned to the land, which is used as a plant site, will not be depreciated, while the costs assigned to land improvements will be depreciated. Explain this seemingly contradictory application of the concept of depreciation.
- 4. What would be the effect on the income statement and balance sheet if the cost of filling and grading land of \$12,000 [payment (i)] was incorrectly classified as Land Improvements rather than Land? Assume Land Improvements are depreciated over a 20-year life using the double-declining-balance method.

## PR 9-2A Comparing three depreciation methods

OBJ. 2

Monte's Coffee Company purchased packaging equipment on January 5, 2014, for \$90,000. The equipment was expected to have a useful life of three years, or 20,000 operating hours, and a residual value of \$6,000. The equipment was used for 8,900 hours during 2014, 7,100 hours in 2015, and 4,000 hours in 2016.

#### Instructions

1. Determine the amount of depreciation expense for the years ended December 31, 2014, 2015, and 2016 by (a) the straight-line method, (b) the units-of-output method, and (c) the double-declining-balance method. Also determine the total depreciation expense for the three years by each method. The following columnar headings are suggested for recording the depreciation expense amounts:

	Depreciation Expense		
Year	Straight-	Units-of-	Double-Declining-
	Line	Output	Balance
	Method	Method	Method

- 2. What method yields the highest depreciation expense for 2014?
- 3. What method yields the most depreciation over the three-year life of the equipment?

## PR 9-3A Depreciation by three methods; partial years

OBJ. 2

Perdue Company purchased equipment on April 1, 2014, for \$270,000. The equipment was expected to have a useful life of three years, or 18,000 operating hours, and a residual value of \$9,000. The equipment was used for 7,500 hours during 2014, 5,500 hours in 2015, 4,000 hours in 2016, and 1,000 hours in 2017.

#### **Instructions**

Determine the amount of depreciation expense for the years ended December 31, 2014, 2015, 2016, and 2017, by (a) the straight-line method, (b) the units-of-output method, and (c) the double-declining-balance method.

## PR 9-4A Depreciation by two methods; sale of fixed asset

OBJ. 2, 3

New lithographic equipment, acquired at a cost of \$800,000 at the beginning of a fiscal year, has an estimated useful life of five years and an estimated residual value of \$90,000. The manager requested information regarding the effect of alternative methods on the amount of depreciation expense each year. On the basis of the data presented to the manager, the double-declining-balance method was selected.

In the first week of the fifth year, the equipment was sold for \$135,000.

#### **Instructions**

1. Determine the annual depreciation expense for each of the estimated five years of use, the accumulated depreciation at the end of each year, and the book value of the equipment at the end of each year by (a) the straight-line method and (b) the

(Continued)

✓ 1. a. 2014: straight-line depreciation, \$28,000





√ a. 2014: \$65,250



✓ 1. b. Year 1: \$320,000 depreciation expense



General Ledger

double-declining-balance method. The following columnar headings are suggested for each schedule:

		Accumulated	
	Depreciation	Depreciation,	Book Value,
Year	Expense	End of Year	End of Year

- 2. Journalize the entry to record the sale.
- Journalize the entry to record the sale, assuming that the equipment was sold for \$88,750 instead of \$135,000.

## PR 9-5A Transactions for fixed assets, including sale

OBJ. 1, 2, 3

The following transactions, adjusting entries, and closing entries were completed by Legacy Furniture Co. during a three-year period. All are related to the use of delivery equipment. The double-declining-balance method of depreciation is used.

2014

- Jan. 4. Purchased a used delivery truck for \$28,000, paying cash.
- Nov. 2. Paid garage \$675 for miscellaneous repairs to the truck.
- Dec. 31. Recorded depreciation on the truck for the year. The estimated useful life of the truck is four years, with a residual value of \$5,000 for the truck.

2015

- Jan. 6. Purchased a new truck for \$48,000, paying cash.
- Apr. 1. Sold the used truck for \$15,000. (Record depreciation to date in 2015 for the truck.)
- June 11. Paid garage \$450 for miscellaneous repairs to the truck.
- Dec. 31. Record depreciation for the new truck. It has an estimated residual value of \$9,000 and an estimated life of five years.

2016

- July 1. Purchased a new truck for \$54,000, paying cash.
- Oct. 2. Sold the truck purchased January 6, 2015, for \$16,750. (Record depreciation to date for 2016 for the truck.)
- Dec. 31. Recorded depreciation on the remaining truck. It has an estimated residual value of \$12,000 and an estimated useful life of eight years.

## **Instructions**

Journalize the transactions and the adjusting entries.

## PR 9-6A Amortization and depletion entries

OBJ. 4, 5

✓ 1. a. \$352,000

General Ledger

Data related to the acquisition of timber rights and intangible assets during the current year ended December 31 are as follows:

- a. Timber rights on a tract of land were purchased for \$1,600,000 on February 22. The stand of timber is estimated at 5,000,000 board feet. During the current year, 1,100,000 board feet of timber were cut and sold.
- b. On December 31, the company determined that \$3,750,000 of goodwill was impaired.
- c. Governmental and legal costs of \$6,600,000 were incurred on April 3 in obtaining a patent with an estimated economic life of 12 years. Amortization is to be for three-fourths of a year.

## **Instructions**

- 1. Determine the amount of the amortization, depletion, or impairment for the current year for each of the foregoing items.
- 2. Journalize the adjusting entries required to record the amortization, depletion, or impairment for each item.

## **Problems: Series B**

✓ Land, \$860,000

## PR 9-1B Allocating payments and receipts to fixed asset accounts

OBJ, 1

The following payments and receipts are related to land, land improvements, and buildings acquired for use in a wholesale apparel business. The receipts are identified by an asterisk.

a.	Fee paid to attorney for title search	\$ 3,600
b.	Cost of real estate acquired as a plant site: Land	720,000
	Building	60,000
c.	Finder's fee paid to real estate agency	23,400
d.	Delinquent real estate taxes on property, assumed by purchaser	15,000
e.	Architect's and engineer's fees for plans and supervision	75,000
f.	Cost of removing building purchased with land in (b)	10,000
g.	Proceeds from sale of salvage materials from old building	3,400*
h.	Cost of filling and grading land	18,000
i.	Premium on one-year insurance policy during construction	8,400
j.	Money borrowed to pay building contractor	800,000*
k.	Special assessment paid to city for extension of water main to the property	13,400
l.	Cost of repairing windstorm damage during construction	3,000
m.	Cost of repairing vandalism damage during construction	2,000
n.	Cost of trees and shrubbery planted	14,000
0.	Cost of paving parking lot to be used by customers	21,600
p.	Interest incurred on building loan during construction	40,000
q.	Proceeds from insurance company for windstorm and vandalism damage	4,500*
r.	Payment to building contractor for new building	800,000
s.	Refund of premium on insurance policy (i) canceled after 10 months	1,400*

#### **Instructions**

1. Assign each payment and receipt to Land (unlimited life), Land Improvements (limited life), Building, or Other Accounts. Indicate receipts by an asterisk. Identify each item by letter and list the amounts in columnar form, as follows:

		Land		Other
ltem	Land	Improvements	Building	Accounts

- 2. Determine the amount debited to Land, Land Improvements, and Building.
- The costs assigned to the land, which is used as a plant site, will not be depreciated, while the costs assigned to land improvements will be depreciated. Explain this seemingly contradictory application of the concept of depreciation.
- 4. What would be the effect on the income statement and balance sheet if the cost of paving the parking lot of \$21,600 [payment (o)] was incorrectly classified as Land rather than Land Improvements? Assume Land Improvements are depreciated over a 10-year life using the double-declining-balance method.

## PR 9-2B Comparing three depreciation methods

Waylander Coatings Company purchased waterproofing equipment on January 6, 2015, for \$320,000. The equipment was expected to have a useful life of four years, or 20,000 operating hours, and a residual value of \$35,000. The equipment was used for 7,200 hours during 2015, 6,400 hours in 2016, 4,400 hours in 2017, and 2,000 hours in 2018.

## **Instructions**

1. Determine the amount of depreciation expense for the years ended December 31, 2015, 2016, 2017, and 2018, by (a) the straight-line method, (b) the units-of-output method, and (c) the double-declining-balance method. Also determine the total depreciation expense for the four years by each method. The following columnar headings are suggested for recording the depreciation expense amounts:

	Depreciation Expense		
	Straight-	Units-of-	Double-Declining-
Year	Line Method	Output Method	Balance Method
rear	Method	Method	Method

(Continued)

√ 1. a. 2015: straightline depreciation, \$71,250





- 2. What method yields the highest depreciation expense for 2015?
- 3. What method yields the most depreciation over the four-year life of the equipment?

## PR 9-3B Depreciation by three methods; partial years

OBJ. 2

Layton Company purchased tool sharpening equipment on October 1, 2014, for \$108,000. The equipment was expected to have a useful life of three years, or 12,000 operating hours, and a residual value of \$7,200. The equipment was used for 1,350 hours during 2014, 4,200 hours in 2015, 3,650 hours in 2016, and 2,800 hours in 2017.

## **Instructions**

Determine the amount of depreciation expense for the years ended December 31, 2014, 2015, 2016, and 2017, by (a) the straight-line method, (b) the units-of-output method, and (c) the double-declining-balance method.

## PR 9-4B Depreciation by two methods; sale of fixed asset

OBJ. 2, 3

✓ 1. b. Year 1, \$55,000 depreciation expense

✓ a. 2014, \$8,400



General Ledger

New tire retreading equipment, acquired at a cost of \$110,000 at the beginning of a fiscal year, has an estimated useful life of four years and an estimated residual value of \$7,500. The manager requested information regarding the effect of alternative methods on the amount of depreciation expense each year. On the basis of the data presented to the manager, the double-declining-balance method was selected.

In the first week of the fourth year, the equipment was sold for \$18,000.

#### **Instructions**

1. Determine the annual depreciation expense for each of the estimated four years of use, the accumulated depreciation at the end of each year, and the book value of the equipment at the end of each year by (a) the straight-line method and (b) the double-declining-balance method. The following columnar headings are suggested for each schedule:

		Accumulated	
	Depreciation	Depreciation,	Book Value,
Year	Expense	End of Year	End of Year

- 2. Journalize the entry to record the sale.
- 3. Journalize the entry to record the sale, assuming that the equipment sold for \$10,500 instead of \$18,000.

## PR 9-5B Transactions for fixed assets, including sale

OBJ. 1, 2, 3

The following transactions, adjusting entries, and closing entries were completed by Robinson Furniture Co. during a three-year period. All are related to the use of delivery equipment. The double-declining-balance method of depreciation is used.

2014

- Jan. 8. Purchased a used delivery truck for \$24,000, paying cash.
- Mar. 7. Paid garage \$900 for changing the oil, replacing the oil filter, and tuning the engine on the delivery truck.
- Dec. 31. Recorded depreciation on the truck for the fiscal year. The estimated useful life of the truck is four years, with a residual value of \$4,000 for the truck.

2015

- Jan. 9. Purchased a new truck for \$50,000, paying cash.
- Feb. 28. Paid garage \$250 to tune the engine and make other minor repairs on the used truck.
- Apr. 30. Sold the used truck for \$9,500. (Record depreciation to date in 2015 for the truck.)
- Dec. 31. Record depreciation for the new truck. It has an estimated residual value of \$12,000 and an estimated life of eight years.

General Ledger

2016

- Sept. 1. Purchased a new truck for \$58,500, paying cash.
  - 4. Sold the truck purchased January 9, 2015, for \$36,000. (Record depreciation to date for 2016 for the truck.)
- Dec. 31. Recorded depreciation on the remaining truck. It has an estimated residual value of \$16,000 and an estimated useful life of 10 years.

#### **Instructions**

Journalize the transactions and the adjusting entries.

## PR 9-6B Amortization and depletion entries

**OBJ. 4, 5** 

✓ b. \$150,000

Data related to the acquisition of timber rights and intangible assets during the current year ended December 31 are as follows:

- a. On December 31, the company determined that \$3,400,000 of goodwill was impaired.
- b. Governmental and legal costs of \$4,800,000 were incurred on September 30 in obtaining a patent with an estimated economic life of eight years. Amortization is to be for one-fourth year.
- c. Timber rights on a tract of land were purchased for \$2,975,000 on February 4. The stand of timber is estimated at 12,500,000 board feet. During the current year, 4,150,000 board feet of timber were cut and sold.

#### **Instructions**

- 1. Determine the amount of the amortization, depletion, or impairment for the current year for each of the foregoing items.
- 2. Journalize the adjusting entries to record the amortization, depletion, or impairment for each item.

## **Cases & Projects**



## CP 9-1 Ethics and professional conduct in business

Dave Elliott, CPA, is an assistant to the controller of Lyric Consulting Co. In his spare time, Dave also prepares tax returns and performs general accounting services for clients. Frequently, Dave performs these services after his normal working hours, using Lyric Consulting Co.'s computers and laser printers. Occasionally, Dave's clients will call him at the office during regular working hours.

Discuss whether Dave is performing in a professional manner.

#### CP 9-2 Financial vs. tax depreciation

The following is an excerpt from a conversation between two employees of WXT Technologies, Nolan Sears and Stacy Mays. Nolan is the accounts payable clerk, and Stacy is the cashier.

Nolan: Stacy, could I get your opinion on something?

Stacy: Sure, Nolan.

Nolan: Do you know Rita, the fixed assets clerk?

Stacy: I know who she is, but I don't know her real well. Why?

Nolan: Well, I was talking to her at lunch last Monday about how she liked her job, etc. You know, the usual . . . and she mentioned something about having to keep two sets of books . . . one for taxes and one for the financial statements. That can't be good accounting, can it? What do you think?

Stacy: Two sets of books? It doesn't sound right.

*Nolan*: It doesn't seem right to me either. I was always taught that you had to use generally accepted accounting principles. How can there be two sets of books? What can be the difference between the two?

How would you respond to Nolan and Stacy if you were Rita?

## CP 9-3 Effect of depreciation on net income

Tuttle Construction Co. specializes in building replicas of historic houses. Tim Newman, president of Tuttle Construction, is considering the purchase of various items of equipment on July 1, 2014, for \$400,000. The equipment would have a useful life of five years and no residual value. In the past, all equipment has been leased. For tax purposes, Tim is considering depreciating the equipment by the straight-line method. He discussed the matter with his CPA and learned that, although the straight-line method could be elected, it was to his advantage to use the Modified Accelerated Cost Recovery System (MACRS) for tax purposes. He asked for your advice as to which method to use for tax purposes.

- 1. Compute depreciation for each of the years (2014, 2015, 2016, 2017, 2018, and 2019) of useful life by (a) the straight-line method and (b) MACRS. In using the straight-line method, one-half year's depreciation should be computed for 2014 and 2019. Use the MACRS rates presented in Exhibit 9.
- 2. Assuming that income before depreciation and income tax is estimated to be \$750,000 uniformly per year and that the income tax rate is 40%, compute the net income for each of the years 2014, 2015, 2016, 2017, 2018, and 2019 if (a) the straight-line method is used and (b) MACRS is used.
- 3. What factors would you present for Tim's consideration in the selection of a depreciation method?

## CP 9-4 Applying for patents, copyrights, and trademarks

#### Internet Project

## **Group Project**

Go to the Internet and review the procedures for applying for a patent, a copyright, and a trademark. You may find information available on Wikipedia (Wikipedia.org) useful for this purpose. Prepare a brief written summary of these procedures.





#### **CP 9-5** Fixed asset turnover: three industries

The following table shows the revenues and average net fixed assets for a recent fiscal year for three different companies from three different industries: retailing, manufacturing, and communications.

	Revenues (in millions)	Average Net Fixed Assets (in millions)
Walmart	\$446,950	\$110,101
Occidental Petroleum Corporation	24,172	48,874
Comcast Corporation	62,570	27,396

- a. For each company, determine the fixed asset turnover ratio. Round to two decimal places.
- b. Explain Walmart's ratio relative to the other two companies.



# **Current Liabilities and Payroll**

# Starbucks

**B** uying goods on credit is essential for businesses to run efficiently. The use of credit makes transactions more convenient and improves buying power. For *individuals*, the most common form of short-term credit is a credit card. Credit cards allow individuals to purchase items before they are paid for, while removing the need for individuals to carry large amounts of cash. They also provide documentation of purchases through a monthly credit card statement.

Short-term credit is also used by *businesses* to make purchasing items for manufacture or resale more convenient. It also gives the business control over the payment for goods and services. When **Starbucks** opened its first coffee shop in 1971, it relied on short-term trade credit, or accounts payable,

to purchase ingredients for its coffee shop in Seattle's historic Pike Place Market. Today, Starbucks still relies on accounts payable and short-term trade credit, which also gives them control over cash payments by separating the purchase function from the payment function. Thus, the employee responsible for purchasing the ingredients is separated from the employee responsible for paying for the purchase. This separation of duties can help prevent unauthorized purchases or payments.

In addition to accounts payable, a business like Starbucks can also have current liabilities related to payroll, payroll taxes, employee benefits, short-term notes, unearned revenue, and contingencies. This chapter discusses each of these types of current liabilities.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe and illustrate current liabilities related to accounts payable, current portion of long-term debt, and notes payable.  Current Liabilities  Accounts Payable  Current Portion of Long-Term Debt  Short-Term Notes Payable	EE 10-1
Determine employer liabilities for payroll, including liabilities arising from employee earnings and deductions from earnings. Payroll and Payroll Taxes  Liability for Employee Earnings  Deductions from Employee Earnings  Computing Employee Net Pay  Liability for Employer's Payroll Taxes	EE 10-2 EE 10-3
Describe payroll accounting systems that use a payroll register, employee earnings records, and a general journal.  Accounting Systems for Payroll and Payroll Taxes  Payroll Register  Employee's Earnings Record  Payroll Checks  Computerized Payroll System  Internal Controls for Payroll Systems	EE 10-4, 10-5
Journalize entries for employee fringe benefits, including vacation pay and pensions.  Employees' Fringe Benefits  Vacation Pay  Pensions  Postretirement Benefits Other than Pensions  Current Liabilities on the Balance Sheet	<b>EE</b> 10-6
Describe the accounting treatment for contingent liabilities and journalize entries for product warranties.  Contingent Liabilities Probable and Estimable Probable and Not Estimable Reasonably Possible Remote	EE 10-7
Describe and illustrate the use of the quick ratio in analyzing a company's ability to pay its current liabilities. Financial Analysis and Interpretation: Quick Ratio  At a Gla	EE 10-8  INCE 10 Page 476



## **Current Liabilities**

When a company or a bank advances *credit*, it is making a loan. The company or bank is called a *creditor* (or *lender*). The individuals or companies receiving the loan are called *debtors* (or *borrowers*).

Debt is recorded as a liability by the debtor. *Long-term liabilities* are debts due beyond one year. Thus, a 30-year mortgage used to purchase property is a long-term liability. *Current liabilities* are debts that will be paid out of current assets and are due within one year.

Three types of current liabilities are discussed in this section—accounts payable, the current portion of long-term debt, and short-term notes payable.

## **Accounts Payable**

Accounts payable transactions have been described and illustrated in earlier chapters. These transactions involve a variety of purchases on account, including the purchase of merchandise and supplies. For most companies, accounts payable is the largest

current liability. Exhibit 1 shows the accounts payable balance as a percent of total current liabilities for a number of companies.

Company	Accounts Payable as Percent of Total Current Liabilities
Alcoa Inc	45%
Chevron Corp	67
Gap Inc	50
IBM	18
Verizon Communications, Inc	60
Walgreen Corp	50

## EXHIBIT 1

Accounts Payable as a Percent of Total Current Liabilities

## **Current Portion of Long-Term Debt**

Long-term liabilities are often paid back in periodic payments, called *installments*. Such installments that are due *within* the coming year are classified as a current liability. The installments due *after* the coming year are classified as a long-term liability.

To illustrate, The Coca-Cola Company reported the following debt payments schedule (in millions):¹

Fiscal year ending	
2013	\$ 1,577
2014	2,633
2015	2,451
2016	1,705
2017	1,439
Thereafter	6,508
Total principal payments	\$16,313

The debt of \$1,577 due in 2013 would be reported as a current liability on the December 31, 2012 balance sheet. The remaining debt of \$14,736 (\$16,313 - \$1,577) would be reported as a long-term liability on the balance sheet.

## **Short-Term Notes Payable**

Notes may be issued to purchase merchandise or other assets. Notes may also be issued to creditors to satisfy an account payable created earlier.²

To illustrate, assume that Nature's Sunshine Company issued a 90-day, 12% note for \$1,000, dated August 1, 2015, to Murray Co. for a \$1,000 overdue account. The entry to record the issuance of the note is as follows:

	Aug. 1	Accounts Payable—Murray Co. Notes Payable Issued a 90-day, 12% note on account.	1,000	1,000	
--	--------	---------------------------------------------------------------------------------------	-------	-------	--

When the note matures, the entry to record the payment of \$1,000 plus \$30 interest ( $$1,000 \times 12\% \times 90 \div 360$ ) is as follows:

Oct. 30 Notes Payable 1,000 Interest Expense 30 Cash 1,030 Paid principal and interest due on note.	0
-----------------------------------------------------------------------------------------------------	---

¹ The Coca-Cola Company, Form 10-K For the Fiscal Year Ended December 31, 2012.

²The accounting for notes received to satisfy an account receivable was described and illustrated in Chapter 8, *Receivables*.

The interest expense is reported in the Other Expense section of the income statement for the year ended December 31, 2015. The interest expense account is closed at December 31.

Each note transaction affects a debtor (borrower) and creditor (lender). The following illustration shows how the same transactions are recorded by the debtor and creditor. In this illustration, the debtor (borrower) is Bowden Co., and the creditor (lender) is Coker Co.

	Bowden Co. (B	orrower)		Coker Co. (Cred	ditor)	
<b>May 1.</b> Bowden Co. purchased merchandise on account from Coker Co., \$10,000, 2/10, n/30. The merchandise cost Coker Co. \$7,500.	Merchandise Inventory Accounts Payable	10,000	10,000	Accounts Receivable Sales  Cost of Merchandise Sold Merchandise Inventory	7,500	10,000 7,500
May 31. Bowden Co. issued a 60-day, 12% note for \$10,000 to Coker Co. on account.	Accounts Payable Notes Payable	10,000	10,000	Notes Receivable Accounts Receivable	10,000	10,000
<b>July 30.</b> Bowden Co. paid Coker Co. the amount due on the note of May 31. Interest: $$10,000 \times 12\% \times 60 \div 360$ .	Notes Payable Interest Expense Cash	10,000 200	10,200	Cash Interest Revenue Notes Receivable	10,200	200 10,000

A company may also borrow from a bank by issuing a note. To illustrate, assume that on September 19 Iceburg Company borrowed cash from First National Bank by issuing a \$4,000, 90-day, 15% note to the bank. The entry to record the issuance of the note and the cash proceeds is as follows:

	Sept. 1	Cash Notes Payable Issued a 90-day, 15% note to First National Bank.		4,000	4,000	
--	---------	----------------------------------------------------------------------	--	-------	-------	--

On the due date of the note (December 18), Iceburg Company owes First National Bank \$4,000 plus interest of \$150 ( $$4,000 \times 15\% \times 90 \div 360$ ). The entry to record the payment of the note is as follows:

Dec. 18 Notes Payable Interest Expense Cash Paid principal and interest due on note.	4,000 150	4,150	
--------------------------------------------------------------------------------------	--------------	-------	--

In some cases, a *discounted note* may be issued rather than an interest-bearing note. A discounted note has the following characteristics:

- The interest rate on the note is called the *discount rate*.
- The amount of interest on the note, called the *discount*, is computed by multiplying the discount rate times the face amount of the note.
- The debtor (borrower) receives the face amount of the note less the discount, called the *proceeds*.
- The debtor must repay the face amount of the note on the due date.

To illustrate, assume that on August 10, Cary Company issues a \$20,000, 90-day discounted note to Western National Bank. The discount rate is 15%, and the amount of the discount is \$750 ( $$20,000 \times 15\% \times 90 \div 360$ ). Thus, the proceeds received by Cary Company are \$19,250. The entry by Cary Company is as follows:

Aug. 10	Cash Interest Expense	19,250 750		
	Notes Payable Issued a 90-day discounted note to Western National Bank at a 15% discount rate.		20,000	

The entry when Cary Company pays the discounted note on November 8 is as follows:³

	Nov. 8	Notes Payable Cash Paid note due.	20,000	20,000	
--	--------	-----------------------------------------	--------	--------	--

Other current liabilities that have been discussed in earlier chapters include accrued expenses, unearned revenue, and interest payable. The accounting for wages and salaries, termed *payroll accounting*, is discussed next.

## Example Exercise 10-1 Proceeds from Notes Payable



On July 1, Bella Salon Company borrowed cash from Best Bank by issuing a 60-day note with a face amount of \$60,000.

- a. Determine the proceeds of the note, assuming the note carries an interest rate of 6%.
- b. Determine the proceeds of the note, assuming the note is discounted at 6%.

## Dynamic Exhibit

## Follow My Example 10-1

- a. \$60,000
- b.  $$59,400 [$60,000 ($60,000 \times 6\% \times 60 \div 360)]$

Practice Exercises: PE 10-1A, PE 10-1B

## **Payroll and Payroll Taxes**

In accounting, **payroll** refers to the amount paid to employees for services they provided during the period. A company's payroll is important for the following reasons:



Determine employer liabilities

for payroll, including liabilities arising from employee earnings and deductions from earnings.

- Payroll and related payroll taxes significantly affect the net income of most companies.
- Payroll is subject to federal and state regulations.
- Good employee morale requires payroll to be paid timely and accurately.

## **Liability for Employee Earnings**

Salary usually refers to payment for managerial and administrative services. Salary is normally expressed in terms of a month or a year. Wages usually refers to payment for employee manual labor. The rate of wages is normally stated on an hourly or a weekly basis. The salary or wage of an employee may be increased by bonuses, commissions, profit sharing, or cost-of-living adjustments.

Companies engaged in interstate commerce must follow the Fair Labor Standards Act. This act, sometimes called the Federal Wage and Hour Law, requires employers to pay a minimum rate of  $1\frac{1}{2}$  times the regular rate for all hours worked in excess of 40 hours per week. Exemptions are provided for executive, administrative, and some supervisory positions. Increased rates for working overtime, nights, or holidays are common, even when not required by law. These rates may be as much as twice the regular rate.

³ If the accounting period ends before a discounted note is paid, an adjusting entry should record the prepaid (deferred) interest that is not yet an expense. This deferred interest would be deducted from Notes Payable in the Current Liabilities section of the balance sheet.

## Note:

Employee salaries and wages are expenses to an employer.

To illustrate computing an employee's earnings, assume that **John T. McGrath** is a salesperson employed by **McDermott Supply Co.** McGrath's regular rate is \$34 per hour, and any hours worked in excess of 40 hours per week are paid at 1½ times the regular rate. McGrath worked 42 hours for the week ended December 27. His earnings of \$1,462 for the week are computed as follows:

Earnings at regular rate (40 hrs. $\times$ \$34)	\$1,360
Earnings at overtime rate [2 hrs. $\times$ (\$34 $\times$ 1½)]	102
Total earnings	\$1,462

## **Deductions from Employee Earnings**

The total earnings of an employee for a payroll period, including any overtime pay, are called **gross pay**. From this amount is subtracted one or more *deductions* to arrive at the **net pay**. Net pay is the amount paid the employee. The deductions normally include federal, state, and local income taxes, medical insurance, and pension contributions.

**Income Taxes** Employers normally withhold a portion of employee earnings for payment of the employees' federal income tax. Each employee authorizes the amount to be withheld by completing an "Employee's Withholding Allowance Certificate," called a W-4. Exhibit 2 is the W-4 form submitted by **John T. McGrath**.

## EXHIBIT 2

Employee's Withholding Allowance Certificate (W-4 Form)

	W_A	Employe	e's Withholding	Allowan	ce Cert	tificat	e	1	OMB No. 1545-0074
	nent of the Treasury Revenue Service		tled to claim a certain number e IRS. Your employer may be						2014
1	Your first name	and middle initial	Last name				2 Your	social se	curity number
	John T.		McGrath				381	48	9120
	Home address (	number and street or rural route)		3 X Single	Married	Marrie	d, but withh	old at his	gher Single rate.
	1830 4th	Street		Note. If married, b	out legally separa	ted, or spou	ise is a nonre	sident alie	n, check the "Single" box.
	City or town, sta	te, and ZIP code		4 If your last n	ame differs fr	om that s	hown on yo	our socia	I security card,
	Clinton, Iowa 52732-6142 check here. You must call 1-800-772-1213 for a replace			cement card. 🕨					
5	Total number	of allowances you are clair	ming (from line H above	or from the app	olicable wor	ksheet o	n page 2)	5	5
6	Additional am	ount, if any, you want with	held from each paycheck	·				. 6	\$
7	I claim exemp	tion from withholding for 2	2013, and I certify that I m	neet <b>both</b> of the	e following	condition	s for exe	mption.	
	• Last year I h	nad a right to a refund of al	I federal income tax with	held because I	had no tax	liability,	and		
	This year I e	expect a refund of all feder	al income tax withheld be	ecause I expec	t to have <b>no</b>	tax liab	ility.		
	If you meet b	oth conditions, write "Exen	npt" here			▶	7		
Under	penalties of per	jury, I declare that I have exa	mined this certificate and,	to the best of n	ny knowledg	e and be	lief, it is tru	ue, corre	ect, and complete.
	oyee's signature orm is not valid	unless you sign it.) ► Jo	hu 7. M	cGrati	r		Date ►	June	2, 2013
8	Employer's nam	e and address (Employer: Comp	lete lines 8 and 10 only if send	ling to the IRS.)	9 Office code	(optional)	10 Empl	oyer iden	tification number (EIN)
Far Di	rivacy Act and I	Paperwork Reduction Act N	Intice see page 2		Cat. No. 10	2200			Form <b>W-4</b> (2013)

On the W-4, an employee indicates marital status and the number of withholding allowances. A single employee may claim one withholding allowance. A married employee may claim an additional allowance for a spouse. An employee may also claim an allowance for each dependent other than a spouse. Each allowance reduces the federal income tax withheld from the employee's pay. Exhibit 2 indicates that McGrath is single and, thus, claimed one withholding allowance.

The federal income tax withheld depends on each employee's gross pay and W-4 allowance. Withholding tables issued by the Internal Revenue Service (IRS) are used to determine amounts to withhold. Exhibit 3 is an example of an IRS wage withholding table for a single person who is paid weekly.⁴

In Exhibit 3, each row is the employee's wages after deducting the employee's withholding allowances. Each year, the amount of the standard withholding allowance is determined by the IRS. For ease of computation and because this amount changes each year, we assume that the standard withholding allowance to be deducted in Exhibit 3 for a single person paid weekly is \$75.5 Thus, if two withholding allowances are claimed, \$150 (\$75 × 2) is deducted.

⁴ IRS withholding tables are also available for married employees and for pay periods other than weekly.

⁵ The actual IRS standard withholding allowance changes every year and was \$75.00 for 2013.

#### Table for Percentage Method of Withholding WEEKLY Payroll Period (a) SINGLE person (including head of household)-If the amount of wages (after subtracting withholding allowances) The amount of income tax to withhold is: Not over \$42 . . . . . . . . . . . . . . . . . . \$0 Over-But not overof excess over-—\$214 . . \$0.00 plus 10% \$42 -\$42 -\$214 \$214 —\$739 . . \$17.20 plus 15% —\$1,732 . . \$95.95 plus 25% McGrath wage bracket \$739 <del>---\$739</del> —\$3,566 . . \$344.20 plus 28% \$1,732 -\$1,732 —\$7,703 . . \$857.72 plus 33% \$3,566 -\$3,566 -\$7,735 . . \$2,222.93 plus 35% \$7,703 -\$7,703 \$2,234.13 plus 39.6% -\$7,735 \$7,735 Source: Publication 15, Employer's Tax Guide, Internal Revenue Service, 2013.

**EXHIBIT 3** 

Wage Bracket
Withholding Table

To illustrate, **John T. McGrath** made \$1,462 for the week ended December 27. McGrath's W-4 claims one withholding allowance of \$75. Thus, the wages used in determining McGrath's withholding bracket in Exhibit 3 are \$1,387 (\$1,462 - \$75).

After the person's withholding wage bracket has been computed, the federal income tax to be withheld is determined as follows:

- Step 1. Locate the proper withholding wage bracket in Exhibit 3.

  McGrath's wages after deducting one standard IRS withholding allowance are \$1,387 (\$1,462 \$75). Therefore, the wage bracket for McGrath is \$739-\$1,732.
- Step 2. Compute the withholding for the proper wage bracket using the directions in the two right-hand columns in Exhibit 3.

For McGrath's wage bracket, the withholding is computed as "\$95.95 plus 25% of the excess over \$739." Hence, McGrath's withholding is \$257.95, computed as follows:

Initial withholding from wage bracket	\$ 95.95
Plus [25% × (\$1,387 – \$739)]	162.00
Total withholding	\$257.95

cities including
Detroit, the District
of Columbia, and New York
City must pay a city income
tax in addition to their federal
and state income taxes.

Employers may also be required to withhold state or city income taxes. The amounts to be withheld are determined on state-by-state and city-by-city bases.

## Example Exercise 10-2 Federal Income Tax Withholding



Residents of certain

Karen Dunn's weekly gross earnings for the present week were \$2,250. Dunn has two exemptions. Using the wage bracket withholding table in Exhibit 3 with a \$75 standard withholding allowance for each exemption, what is Dunn's federal income tax withholding?

Follow My Example 10-2		
Total wage payment		\$ 2,250
Multiplied by allowances claimed on Form W-4  Amount subject to withholding	<u>× 2</u>	150 \$ 2,100
Initial withholding from wage bracket in Exhibit 3		\$344.20 103.04*
*28% × (\$2,100 – \$1,732)		\$447.24

Practice Exercises: PE 10-2A, PE 10-2B

**FICA Tax** Employers are required by the Federal Insurance Contributions Act (FICA) to withhold a portion of the earnings of each employee. The **FICA tax** withheld contributes to the following two federal programs:

- Social security, which provides payments for retirees, survivors, and disability insurance.
- Medicare, which provides health insurance for senior citizens.

The amount withheld from each employee is based on the employee's earnings *paid* in the *calendar* year. The withholding tax rates and maximum earnings subject to tax are often revised by Congress.⁶ To simplify, this chapter assumes the following rates and earnings subject to tax:

- Social security: 6% on all earnings
- Medicare: 1.5% on all earnings

To illustrate, assume that **John T. McGrath**'s earnings for the week ending December 27 are \$1,462 and the total FICA tax to be withheld is \$109.65, computed as follows:

Earnings subject to 6% social security tax	× 6%	\$ 87.72
Earnings subject to 1.5% Medicare tax		
Medicare tax	X 1.370	21.93
Total FICA tax		\$109.65

**Other Deductions** Employees may choose to have additional amounts deducted from their gross pay. For example, an employee may authorize deductions for retirement savings, for charitable contributions, or life insurance. A union contract may also require the deduction of union dues.

## **Computing Employee Net Pay**

Gross earnings less payroll deductions equals *net pay*, sometimes called *take-home pay*. Assuming that **John T. McGrath** authorized deductions for retirement savings and for a United Fund contribution, McGrath's net pay for the week ended December 27 is \$1,069.40, computed as follows:

Gross earnings for the week		\$1,462.00
Deductions:		
Social security tax	\$ 87.72	
Medicare tax	21.93	
Federal income tax	257.95	
Retirement savings	20.00	
United Fund	5.00	
Total deductions		392.60
Net pay		\$1,069.40

## Example Exercise 10-3 Employee Net Pay



Karen Dunn's weekly gross earnings for the week ending December 3 were \$2,250, and her federal income tax withholding was \$447.24. Assuming the social security rate is 6% and Medicare is 1.5%, what is Dunn's net pay?

## Follow My Example 10-3

Total wage payment		\$2,250.00
Less: Federal income tax withholding	\$447.24	
Social security tax (\$2,250 × 6%)	135.00	
Medicare tax (\$2,250 × 1.5%)	33.75	615.99
Net pay		\$1,634.01

Practice Exercises: PE 10-3A, PE 10-3B

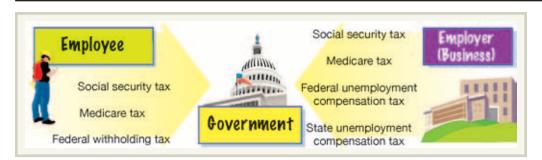
⁶ For 2013, the social security tax rate was 6.2% and the Medicare tax rate was 1.45%. Earnings subject to the social security tax are limited to an annual threshold amount, but for text examples and problems, assume all accumulated annual earnings are below this threshold and subject to the tax.

## **Liability for Employer's Payroll Taxes**

Employers are subject to the following payroll taxes for amounts paid their employees:

- FICA Tax: Employers must match the employee's FICA tax contribution.
- Federal Unemployment Compensation Tax (FUTA): This employer tax provides for temporary payments to those who become unemployed. The tax collected by the federal government is allocated among the states for use in state programs rather than paid directly to employees. Congress often revises the FUTA tax rate and maximum earnings subject to tax.
- State Unemployment Compensation Tax (SUTA): This employer tax also provides temporary payments to those who become unemployed. The FUTA and SUTA programs are closely coordinated, with the states distributing the unemployment checks.⁷ SUTA tax rates and earnings subject to tax vary by state.8

The preceding employer taxes are an operating expense of the company. Exhibit 4 summarizes the responsibility for employee and employer payroll taxes.



## **EXHIBIT 4**

**Responsibility for Tax Payments** 



# 

## THE MOST YOU WILL EVER PAY

In 1936, the Social Security Board described how the tax was expected to affect a worker's pay, as follows:

The taxes called for in this law will be paid both by your employer and by you. For the next 3 years you will pay maybe 15 cents a week, maybe 25 cents a week, maybe 30 cents or more, according to what you earn. That is to say, during the next 3 years, beginning January 1, 1937, you will pay 1 cent for every dollar you earn, and at the same time your employer will pay 1 cent for every dollar you earn, up to \$3,000 a year....

. . . Beginning in 1940 you will pay, and your employer will pay, 1½ cents for each dollar you earn, up to \$3,000 a year . . . and then beginning in 1943, you will pay 2 cents, and so will your employer, for every dollar you earn for the next three years. After that, you and your employer will each pay half a cent more for 3 years, and finally, beginning in 1949, . . . you and your employer will each pay 3 cents on each dollar you earn, up to \$3,000 a year. That is the most you will ever pay.

The rate on January 1, 2013, was 7.65 cents per dollar earned (7.65%). The social security portion was 6.20% on the first \$110,100 of earnings. The Medicare portion was 1.45% on all earnings.

Source: Arthur Lodge, "That Is the Most You Will Ever Pay," Journal of Accountancy, October 1985, p. 44.

## **Accounting Systems for Payroll** and Payroll Taxes

Payroll systems should be designed to:

- Pay employees accurately and timely.
- Meet regulatory requirements of federal, state, and local agencies.
- Provide useful data for management decision-making needs.

Describe payroll accounting systems that use a payroll register, employee earnings records, and a general journal.

 $^{^{7}}$  This rate may be reduced to 0.8% for credits for state unemployment compensation tax.

⁸ For 2013, the maximum state rate credited against the federal unemployment rate was 5.4% of the first \$7,000 of each employee's earnings during a calendar year.

## **EXHIBIT 5**

## **Payroll Register**

			Ear	nings		
	Employee Name	Total Hours	Regular	Overtime	Total	
1	Abrams, Julie S.	40	500.00		500.00	1
2	Elrod, Fred G.	44	392.00	58.80	450.80	2
3	Gomez, Jose C.	40	840.00		840.00	3
4	McGrath, John T.	42	1,360.00	102.00	1,462.00	4
25	Wilkes, Glenn K.	40	480.00		480.00	25
26	Zumpano, Michael W.	40	600.00		600.00	26
27	Total		13,328.00	574.00	13,902.00	27
28						28

Although payroll systems differ among companies, the major elements of most payroll systems are:

- Payroll register
- · Employee's earnings record
- Payroll checks

## **Payroll Register**

The **payroll register** is a multicolumn report used for summarizing the data for each payroll period. Although payroll registers vary by company, a payroll register normally includes the following columns:

- Employee name
- Total hours worked
- Regular earnings
- Overtime earnings
- Total gross earnings
- Social security tax withheld
- Medicare tax withheld

- Federal income tax withheld
- Retirement savings withheld
- Miscellaneous items withheld
- Total withholdings
- Net pay
- Check number of payroll check issued
- Accounts debited for payroll expense

Exhibit 5 illustrates a payroll register for **McDermott Supply Co.** The two right-hand columns of the payroll register indicate the accounts debited for the payroll expense. These columns are often referred to as the *payroll distribution*.

**Recording Employees' Earnings** The column totals of the payroll register provide the basis for recording the journal entry for payroll. The entry based on the payroll register in Exhibit 5 follows:

	Dec.	27	Sales Salaries Expense	11,122.00		
			Office Salaries Expense	2,780.00		
			Social Security Tax Payable		834.12	
			Medicare Tax Payable		208.53	
			Employees Federal Income Tax Payable		3,332.00	
			Retirement Savings Deductions Payable		680.00	
			United Fund Deductions Payable		520.00	
			Salaries Payable		8,327.35	
			Payroll for week ended December 27.			

## EXHIBIT 5

## (Concluded)

			Deductio	ns Withheld				Paid	d	Account	s Debited	
	Social Security Tax	Medicare Tax	Federal Income Tax	Retirement Savings	N	⁄lisc.	Total	Net Pay	Check No.	Sales Salaries Expense	Office Salaries Expense	
1	30.00	7.50	48.85	20.00	UF	10.00	116.35	383.65	6857	500.00		1
2	27.05	6.76	30.22		UF	50.00	114.03	336.77	6858		450.80	2
3	50.40	12.60	83.70	25.00	UF	10.00	181.70	658.30	6859	840.00		3
4	87.72	21.93	257.95	20.00	UF	5.00	392.60	1,069.40	6860	1,462.00		4
25	28.80	7.20	45.85	10.00			91.85	388.15	6880	480.00		25
26	36.00	9.00	63.85	5.00	UF	2.00	115.85	484.15	6881		600.00	26
27	834.12	208.53	3,332.00	680.00	UF	520.00	5,574.65	8,327.35		11,122.00	2,780.00	27
28												28
				Miscellane	ous D	eduction	s: UF—Unite	d Fund				

**Recording and Paying Payroll Taxes** Payroll taxes are recorded as liabilities when the payroll is *paid* to employees. In addition, employers compute and report payroll taxes on a *calendar-year* basis, which may differ from the company's fiscal year.

#### Note:

Payroll taxes become a liability to the employer when the payroll is paid.

## Example Exercise 10-4 Journalize Period Payroll



The payroll register of Chen Engineering Services indicates \$900 of social security withheld and \$225 of Medicare tax withheld on total salaries of \$15,000 for the period. Federal withholding for the period totaled \$2,925.

Provide the journal entry for the period's payroll.

## Follow My Example 10-4

Salaries Expense	15,000
Social Security Tax Payable	900
Medicare Tax Payable	225
Employees Federal Income Tax Payable	2,925
Salaries Payable	10,950

Practice Exercises: PE 10-4A, PE 10-4B

## On December 27, McDermott Supply has the following payroll data:

Sales salaries	\$11,122 2,780 \$13,902
Wages subject to payroll taxes:	
Social security tax (6%)	\$13,902
Medicare tax (1.5%)	13,902
State (5.4%) and federal (0.8%)	
unemployment compensation tax	2,710

Employers must match the employees' social security and Medicare tax contributions. In addition, the employer must pay state unemployment compensation tax (SUTA) of 5.4% and federal unemployment compensation tax (FUTA) of 0.8%. When payroll is paid on December 27, these payroll taxes are computed as follows:

Social security tax \$ 834.12 (\$13,902  $\times$  6%, and from Social Security Tax column of Exhibit 5) Medicare tax 208.53 (\$13,902  $\times$  1.5%, and from Medicare Tax column of Exhibit 5)

SUTA 146.34 (\$2,710 × 5.4%) FUTA 21.68 (\$2,710 × 0.8%)

Total payroll taxes \$1,210.67

The entry to journalize the payroll tax expense for Exhibit 5 follows:

Dec.	27	Payroll Tax Expense Social Security Tax Payable Medicare Tax Payable State Unemployment Tax Payable Federal Unemployment Tax Payable	1,210.67	834.12 208.53 146.34 21.68	
		Payroll taxes for week ended December 27.			

The preceding entry records a liability for each payroll tax. When the payroll taxes are paid, an entry is recorded debiting the payroll tax liability accounts and crediting Cash.

## Example Exercise 10-5 Journalize Payroll Tax



The payroll register of Chen Engineering Services indicates \$900 of social security withheld and \$225 of Medicare tax withheld on total salaries of \$15,000 for the period. Earnings of \$5,250 are subject to state and federal unemployment compensation taxes at the federal rate of 0.8% and the state rate of 5.4%.

Provide the journal entry to record the payroll tax expense for the period.

(Continued)

## **EXHIBIT 6**

**Employee's Earnings Record** 

Clinton, IA 52732-6142 PHONE: 555-3148								
SII	W	JMBER C ITHHOLE LOWAN	DING	PAY RATE:	\$1,360.00 F	Per Week		
00	CCUPATION: Sal	esperson	1	EQUIVAL	ENT HOURLY	' RATE: \$34		
				Earning	S			
	Period Ending	Total Hours	Regular Earnings	Overtime Earnings	Total Earnings	Total		
	SEDT 27		4 250 00	552.00	2 022 00	75 565 00		
12	SEPT. 27	53	1,360.00	663.00	2,023.00	75,565.00	4	
13	THIRD QUARTER		17,680.00	7,605.00	25,285.00			
14	OCT. 4	51	1,360.00	561.00	1,921.00	77,486.00		
50	NOV. 15	50	1,360.00	510.00	1,870.00	89,382.00		
51	NOV. 22	53	1,360.00	663.00	2,023.00	91,405.00	1	
52	NOV. 29	47	1,360.00	357.00	1,717.00	93,122.00		
3	DEC. 6	53	1,360.00	663.00	2,023.00	95,145.00		
54	DEC.13	52	1,360.00	612.00	1,972.00	97,117.00	Ī	
55	DEC. 20	51	1,360.00	561.00	1,921.00	99,038.00		
6	DEC. 27	42	1,360.00	102.00	1,462.00	100,500.00		
57	FOURTH QUARTER		17,680.00	7,255.00	24,935.00			
58	YEARLY TOTAL		70,720.00	29,780.00	100,500.00			

Follow My Example 10-5	
Payroll Tax Expense	1,450.50 900.00
Medicare Tax Payable	225.00 283.50*
Federal Unemployment Tax Payable*\$5,250 × 5.4%	42.00**
**\$5,250 × 0.8%	
	Practice Exercises: PE 10-5A, PE 10-5B

## **Employee's Earnings Record**

Each employee's earnings to date must be determined at the end of each payroll period. This total is necessary for computing the employee's social security tax withholding and the employer's payroll taxes. Thus, detailed payroll records must be kept for each employee. This record is called an **employee's earnings record**.

Exhibit 6 shows a portion of **John T. McGrath**'s employee's earnings record. An employee's earnings record and the payroll register are interrelated. For example, McGrath's earnings record for December 27 can be traced to the fourth line of the payroll register in Exhibit 5.

## EXHIBIT 6

(Concluded)

SC	OC. SEC. NO.:	381-48-9120						EMPLOY	EE NO.: 8	314
D/	ATE OF BIRTH	: February 15,	1982							
		_								
DA	ATE EMPLOYI	MENT TERMINA	ATED:							
			Dedu	ıctions				Paid		
	Social Security Tax	Medicare Tax	Federal Income Tax	Retirement Savings		Other	Total	Net Amount	Check No.	
42	121.38	30.35	404.68	20.00			576.41	1,446.59	6175	42
43	1,517.10	379.28	5,391.71	260.00	UF	40.00	7,588.09	17,696.91		43
44	115.26	28.82	376.12	20.00			540.20	1,380.80	6225	44
50	112.20	28.05	361.84	20.00			522.09	1,347.91	6530	50
51	121.38	30.35	404.68	20.00			576.41	1,446.59	6582	51
52	103.02	25.76	321.70	20.00			470.48	1,246.52	6640	52
53	121.38	30.35	404.68	20.00	UF	5.00	581.41	1,441.59	6688	53
54	118.32	29.58	390.40	20.00			558.30	1,413.70	6743	54
55	115.26	28.82	376.12	20.00			540.20	1,380.80	6801	55
56	87.72	21.93	257.95	20.00	UF	5.00	392.60	1,069.40	6860	56
57	1,496.10	374.03	5,293.71	260.00	UF	15.00	7,438.84	17,496.16		57
58	6,030.00	1,507.50	21,387.65	1,040.00	UF	100.00	30,065.15	70,434.85		58

As shown in Exhibit 6, an employee's earnings record has quarterly and yearly totals. These totals are used for tax, insurance, and other reports. For example, one such report is the Wage and Tax Statement, commonly called a *W-2*. This form is provided annually to each employee as well as to the Social Security Administration. The W-2 shown in Exhibit 7 is based on **John T. McGrath**'s employee's earnings record shown in Exhibit 6.

EXHIBIT 7 Emp	loyee's Wage and Ta	x Stateme	nt (W	·2 Form)		
22222 Void a Em	ployee's social security number 381-48-9120	For Official U	-	•		
b Employer identification number (EIN)		4	1	ges, tips, other compensation	2 Federal income	tax withheld
61-8436524			,500.00	21,387.65		
c Employer's name, address, and ZIP cod	е			cial security wages	4 Social security t	ax withheld
McDermott Supply Co. 415 5th Ave. So.				0,500.00	6,030.00 6 Medicare tax wit	Unit of all
Dubuque, IA 52736-0142				dicare wages and tips		inneia
				0,500.00	1,507.50	
			7 500	cial security tips	8 Allocated tips	
d Control number			9		10 Dependent care	benefits
e Employee's first name and initial	Last name	Suff.	<b>11</b> No	nqualified plans	12a See instructions	s for box 12
John T.	McGrath				o d e	
1830 4th St. Clinton, IA 52732-6142			13 Statu	utory Retirement Third-party loyee plan sick pay	12b	
			<b>14</b> Oth	er	12c	
					12d	
					c l	
f Employee's address and ZIP code					e	
15 State Employer's state ID number	16 State wages, tips, etc.	17 State incor	ne tax	18 Local wages, tips, etc.	19 Local income tax	20 Locality name
IA						Dubuque
Form W-2 Wage and Tax Copy A For Social Security Administ Form W-3 to the Social Security Admir	ration - Send this entire pag		<u> 1</u> 4	For	of the Treasury—Internal r Privacy Act and Pape	rwork Reduction
	Do Not Cut, Fold, o		orms	on This Page		

## **Payroll Checks**

Companies pay employees either by electronic funds transfer or by issuing *payroll checks*. With electronic funds transfers, the employee's net pay is electronically deposited into their bank account each period. Later, the employees receive a payroll statement summarizing how the net pay was computed. A payroll statement for the electronic funds transfer of **John T. McGrath**'s pay is shown in Exhibit 8. Each payroll check includes a detachable statement showing how the net pay was computed, which is typically identical to the payroll statement accompanying electronic funds transfers (EFTs).

Most companies use a special payroll bank account to disburse payroll. In such cases, payroll is processed as follows:

- 1. The total net pay for the period is determined from the payroll register.
- 2. The company authorizes an electronic funds transfer (EFT) from its regular bank account to the special payroll bank account for the total net pay.
- 3. Individual EFTs or payroll checks are disbursed from the payroll account.
- 4. The numbers of the individual payroll disbursements are inserted in the payroll register.

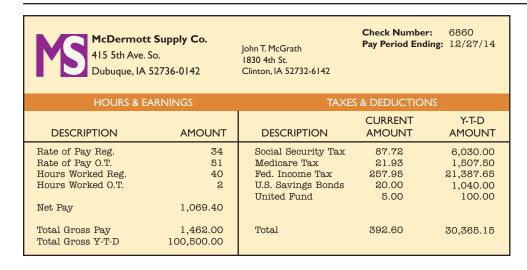


EXHIBIT 8
Payroll Statement

An advantage of using a separate payroll bank account is that reconciling the bank statements is simplified. In addition, a payroll bank account establishes control over payroll checks and, thus, prevents their theft or misuse.

## **Computerized Payroll System**

The inputs into a payroll system may be classified as:

- *Constants:* Data that remain unchanged from payroll to payroll Examples: Employee names, social security numbers, marital status, number of income tax withholding allowances, rates of pay, tax rates, and withholding tables
- Variables: Data that change from payroll to payroll
   Examples: Number of hours or days worked for each employee, accrued days of sick leave, vacation credits, total earnings to date, and total taxes withheld

In a computerized accounting system, constants are stored within a payroll file. The variables are input each pay period by a payroll clerk. In some systems, employees swipe their identification (ID) cards when they report for and leave from work. In such cases, the hours worked by each employee are automatically updated.

A computerized payroll system also maintains electronic versions of the payroll register and employee earnings records. Payroll system outputs, such as payroll checks, electronic funds transfers, and tax records, are automatically produced each pay period.

## **Internal Controls for Payroll Systems**

The cash payment controls described in Chapter 7 also apply to payrolls. Some examples of payroll controls include the following:

- If a check-signing machine is used, blank payroll checks and access to the machine should be restricted to prevent their theft or misuse.
- The hiring and firing of employees should be properly authorized and approved in writing.
- All changes in pay rates should be properly authorized and approved in writing.
- Employees should be observed when arriving for work to verify that employees are "checking in" for work only once and only for themselves. Employees may "check in" for work by using a time card or by swiping their employee ID card.
- Payroll checks should be distributed by someone other than employee supervisors.
- A special payroll bank account should be used.

## Integrity, Objectivity, and Ethics in Business



#### **\$8 MILLION FOR 18 MINUTES OF WORK**

Computer system controls can be very important in issuing payroll checks. In one case, a Detroit schoolteacher was paid \$4,015,625 after deducting \$3,884,375 in payroll deductions for 18 minutes of overtime work. The error was caused by a computer glitch when the teacher's employee identification number was substituted incorrectly in the "hourly wage" field and wasn't caught by the

payroll software. After six days, the error was discovered, and the money was returned. "One of the things that came with (the software) is a fail-safe that prevents that. It doesn't work," a financial officer said. The district has since installed a program to flag any paycheck exceeding \$10,000.

Source: Associated Press, September 27, 2002.



## **Employees' Fringe Benefits**

Many companies provide their employees benefits in addition to salary and wages earned. Such **fringe benefits** may include vacation, medical, and retirement benefits.

The cost of employee fringe benefits is recorded as an expense by the employer. To match revenues and expenses, the estimated cost of fringe benefits is recorded as an expense during the period in which the employees earn the benefits.

## **Vacation Pay**

#### Note:

Vacation pay becomes the employer's liability as the employee earns vacation rights. Most employers provide employees vacations, sometimes called *compensated absences*. The liability to pay for employee vacations could be accrued as a liability at the end of each pay period. However, many companies wait and record an adjusting entry for accrued vacation at the end of the year.

To illustrate, assume that employees earn one day of vacation for each month worked. The estimated vacation pay for the year ending December 31 is \$325,000. The adjusting entry for the accrued vacation is as follows:

	Dec.	31	Vacation Pay Expense Vacation Pay Payable Accrued vacation pay for the year.		325,000	325,000	
--	------	----	------------------------------------------------------------------------------------	--	---------	---------	--

Employees may be required to take all their vacation time within one year. In such cases, any accrued vacation pay will be paid within one year. Thus, the vacation pay payable is reported as a current liability on the balance sheet. If employees are allowed to accumulate their vacation pay, the estimated vacation pay payable that will *not* be taken within a year is reported as a long-term liability.

When employees take vacations, the liability for vacation pay is decreased by debiting Vacation Pay Payable. Salaries or Wages Payable and the other related payroll accounts for taxes and withholdings are credited.

## **Pensions**

A **pension** is a cash payment to retired employees. Pension rights are accrued by employees as they work, based on the employer's pension plan. Two basic types of pension plans are defined contribution and defined benefit plans.⁹

**Defined Contribution Plans** In a **defined contribution plan**, the company invests contributions on behalf of the employee during the employee's working years. Normally, the employee and employer contribute to the plan. The employee's pension depends on the total contributions and the investment returns earned on those contributions.

One of the more popular defined contribution plans is the 401k plan. Under this plan, employees contribute a portion of their gross pay to investments, such as mutual funds. A 401k plan offers employees two advantages.

- The employee contribution is deducted before taxes.
- The contributions and related earnings are not taxed until withdrawn at retirement.

In most cases, the employer matches some portion of the employee's contribution. The employer's cost is debited to *Pension Expense*. To illustrate, assume that Heaven Scent Perfumes Company contributes 10% of employee monthly salaries to an employee 401k plan. Assuming \$500,000 of monthly salaries, the journal entry to record the monthly contribution is as follows:

	Dec. 31	Pension Expense  Cash  Contributed 10% of monthly salaries to pension plan.	50,000	50,000	
--	---------	-----------------------------------------------------------------------------	--------	--------	--

**Defined Benefit Plans** In a **defined benefit plan**, the company pays the employee a fixed annual pension based on a formula. The formula is normally based on such factors as the employee's years of service, age, and past salary.

In a defined benefit plan, the employer is obligated to pay for (fund) the employee's future pension benefits. As a result, many companies are replacing their defined benefit plans with defined contribution plans.

The pension cost of a defined benefit plan is debited to *Pension Expense*. Cash is credited for the amount contributed (funded) by the employer. Any unfunded amount is credited to *Unfunded Pension Liability*.

To illustrate, assume that the defined benefit plan of Hinkle Co. requires an annual pension cost of \$80,000. This annual contribution is based on estimates of Hinkle's future pension liabilities. On December 31, Hinkle Co. pays \$60,000 to the pension fund. The entry to record the payment and the unfunded liability is as follows:

Dec.	31	Pension Expense  Cash  Unfunded Pension Liability  Annual pension cost and contribution.	80,000	60,000 20,000	
		Annual pension cost and contribution.			

If the unfunded pension liability is to be paid within one year, it is reported as a current liability on the balance sheet. Any portion of the unfunded pension liability that will be paid beyond one year is a long-term liability.

⁹ The accounting for pensions is complex due to the uncertainties of estimating future pension liabilities. These estimates depend on such factors as employee life expectancies, employee turnover, expected employee compensation levels, and investment income on pension contributions. Additional accounting and disclosures related to pensions are covered in advanced accounting courses.

## Example Exercise 10-6 Vacation Pay and Pension Benefits



Manfield Services Company provides its employees vacation benefits and a defined contribution pension plan. Employees earned vacation pay of \$44,000 for the period. The pension plan requires a contribution to the plan administrator equal to 8% of employee salaries. Salaries were \$450,000 during the period.

Provide the journal entry for the (a) vacation pay and (b) pension benefit.

 _			_	
6747	My Ex			106
	W W = N	<b>6</b> 2   1   1   0	112	

a.	Vacation Pay Expense	44,000	44,000
b.	Pension Expense	36,000	36,000

Practice Exercises: PE 10-6A, PE 10-6B

## **Postretirement Benefits Other than Pensions**

Employees may earn rights to other postretirement benefits from their employer. Such benefits may include dental care, eye care, medical care, life insurance, tuition assistance, tax services, and legal services.

The accounting for other postretirement benefits is similar to that of defined benefit pension plans. The estimate of the annual benefits expense is recorded by debiting *Postretirement Benefits Expense*. If the benefits are fully funded, Cash is credited for the same amount. If the benefits are not fully funded, a postretirement benefits plan liability account is also credited.

The financial statements should disclose the nature of the postretirement benefit liabilities. These disclosures are usually included as notes to the financial statements. Additional accounting and disclosures for postretirement benefits are covered in advanced accounting courses.

## **Current Liabilities on the Balance Sheet**

Accounts payable, the current portion of long-term debt, notes payable, and any other debts that are due within one year are reported as current liabilities on the balance sheet. The balance sheet presentation of current liabilities for **Mornin' Joe** follows:



Mornin' Joe Balance Sheet December 31, 2016		
Liabilities		
Current liabilities:		
Accounts payable	\$133,000	
Notes payable (current portion)	200,000	
Salaries and wages payable	42,000	
Payroll taxes payable	16,400	
Interest payable	40,000	
Total current liabilities		\$431,400



# 

#### **CITY PENSION PROBLEMS**

In June 2013, the city of Detroit, Michigan entered the record books as the largest municipal bankruptcy in history. While the city's financial problems stemmed from a number of factors, including a shrinking population and deteriorating economy, the city's \$10 billion in pension-related liabilities were a major contributing factor. Detroit, however, is not alone. A number of other cities, including Charleston, West Virginia, Chicago, Illinois, and Providence, Rhode Island, face similar pension burdens. To overcome these challenges, these cities are restructuring their employee pension plans to reduce the strain that pension obligations place on their financial condition.

Source: "A Look at Pension Problems, Solutions in U.S. Cities," The Wall Street Journal, October 6, 2013

# **Contingent Liabilities**

Some liabilities may arise from past transactions only if certain events occur in the future. These potential liabilities are called contingent liabilities.

The accounting for contingent liabilities depends on the following two factors:

- Likelihood of occurring: Probable, reasonably possible, or remote
- Measurement: Estimable or not estimable

The likelihood that the event creating the liability occurring is classified as *probable*, reasonably possible, or remote. The ability to estimate the potential liability is classified as estimable or not estimable.

#### **Probable and Estimable**

If a contingent liability is probable and the amount of the liability can be reasonably estimated, it is recorded and disclosed. The liability is recorded by debiting an expense and crediting a liability.

To illustrate, assume that during June a company sold a product for \$60,000 that includes a 36-month warranty for repairs.¹⁰ The average cost of repairs over the warranty period is estimated at 5% of the sales price. The entry to record the estimated product warranty expense for June is as follows:

		June	30	• •		3,000	3,000	
--	--	------	----	-----	--	-------	-------	--

The preceding entry records warranty expense in the same period in which the sale is recorded. In this way, warranty expense is matched with the related revenue (sales).

If the product is repaired under warranty, the repair costs are recorded by debiting Product Warranty Payable and crediting Cash, Supplies, Wages Payable, or other appropriate accounts. Thus, if a \$200 part is replaced under warranty on August 16, the entry is as follows:

	Aug.	16	Product Warranty Payable Supplies Replaced defective part under warranty.		200	200	
--	------	----	---------------------------------------------------------------------------------	--	-----	-----	--

¹⁰ This discussion is limited to a discussion of assurance type warranties. A more detailed discussion of the types of warranties and their accounting is covered in intermediate and advanced accounting texts.

Describe the accounting treatment for contingent liabilities and journalize entries for product warranties.

The estimated costs of warranty work on new car sales are a contingent liability for Ford Motor Company.

#### Example Exercise 10-7 Estimated Warranty Liability



Cook-Rite Co. sold \$140,000 of kitchen appliances during August under a six-month warranty. The cost to repair defects under the warranty is estimated at 6% of the sales price. On September 12, a customer required a \$200 part replacement plus \$90 of labor under the warranty.

Provide the journal entry for (a) the estimated warranty expense on August 31 for August sales, and (b) the September 12 warranty work.

Follow My Example 10-7		
a. Product Warranty Expense	8,400	
Product Warranty Payable		8,400
To record warranty expense for August, $6\% \times $140,000$ .		
b. Product Warranty Payable	290	
Supplies		200
Wages Payable		90
Replaced defective part under warranty.		

Practice Exercises: PE 10-7A, PE 10-7B

#### **Probable and Not Estimable**

A contingent liability may be probable, but cannot be estimated. In this case, the contingent liability is disclosed in the notes to the financial statements. For example, a company may have accidentally polluted a local river by dumping waste products. At the end of the period, the cost of the cleanup and any fines may not be able to be estimated.

### **Reasonably Possible**

A contingent liability may be only possible. For example, a company may have lost a lawsuit for infringing on another company's patent rights. However, the verdict is under appeal and the company's lawyers feel that the verdict will be reversed or significantly reduced. In this case, the contingent liability is disclosed in the notes to the financial statements.

#### Remote

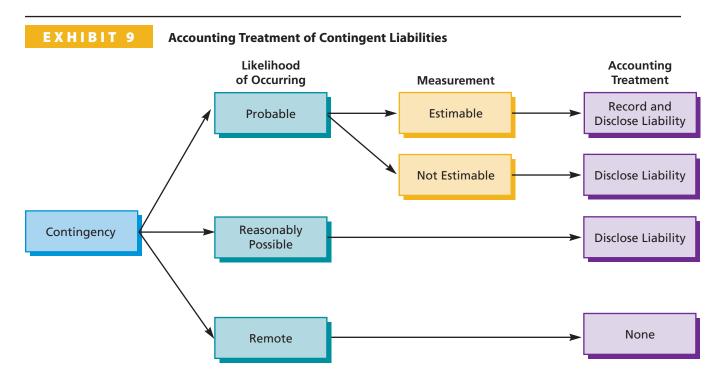
A contingent liability may be remote. For example, a ski resort may be sued for injuries incurred by skiers. In most cases, the courts have found that a skier accepts the risk of injury when participating in the activity. Thus, unless the ski resort is grossly negligent, the resort will not incur a liability for ski injuries. In such cases, no disclosure needs to be made in the notes to the financial statements. The accounting treatment of contingent liabilities is summarized in Exhibit 9.

Common examples of contingent liabilities disclosed in notes to the financial statements are litigation, environmental matters, guarantees, and contingencies from the sale of receivables.

An example of a recent contingent liability disclosure from Google Inc. follows:11

We have had patent, copyright, and trademark infringement lawsuits filed against us claiming that certain of our products, services, and technologies, including Android, Google Search, Google AdWords, Google AdSense, Google Books, Google News, Google Image Search, Google Chrome, Google Talk, Google Voice, Motorola devices and YouTube, infringe the intellectual property rights of others. Adverse results in these lawsuits may include awards of substantial monetary damages, costly royalty or licensing agreements, or orders preventing us from offering certain

¹¹ Google Inc., Form 10-K For the Fiscal Year Ended December 31, 2012.



features, functionalities, products, or services, and may also cause us to change our business practices, and require development of non-infringing products or technologies, which could result in a loss of revenues for us and otherwise harm our business. . . .

With respect to our outstanding legal matters, based on our current knowledge, we believe that the amount or range of reasonably possible loss will not, either individually or in the aggregate, have a material adverse effect on our business, consolidated financial position, results of operations, or cash flows. However, the outcome of such legal matters is inherently unpredictable and subject to significant uncertainties. . . .

Professional judgment is necessary in distinguishing between classes of contingent liabilities. This is especially the case when distinguishing between probable and reasonably possible contingent liabilities.

# Financial Analysis and Interpretation: Quick Ratio

**Current position analysis** helps creditors evaluate a company's ability to pay its current liabilities. This analysis is based on the following three measures:

- Working capital
- Current ratio
- Quick ratio

Working capital and the current ratio were discussed in Chapter 4 and are computed as follows:

Working Capital = Current Assets – Current Liabilities

$$Current Ratio = \frac{Current Assets}{Current Liabilities}$$

While these two measures can be used to evaluate a company's ability to pay its current liabilities, they do not provide insight into the company's ability to pay these

Describe and illustrate the use of the quick ratio in analyzing a company's ability to pay its current liabilities.



liabilities within a short period of time. This is because some current assets, such as inventory, cannot be converted into cash as quickly as other current assets, such as cash and accounts receivable.

The **quick ratio** overcomes this limitation by measuring the "instant" debt-paying ability of a company and is computed as follows:

$$Quick Ratio = \frac{Quick Assets}{Current Liabilities}$$

**Quick assets** are cash and other current assets that can be easily converted to cash. This normally includes cash, temporary investments, and accounts receivable. To illustrate, consider the following data for TechSolutions, Inc., at the end of 2015:

Current assets:	
Cash	\$2,020
Temporary investments	3,400
Accounts receivable	1,600
Inventory	2,000
Other current assets	160
Total current assets	\$9,180
Current liabilities:	
Accounts payable	\$3,000
Other current liabilities	2,400
Total current liabilities	\$5,400
Working capital (current assets – current liabilities)	\$3,780
Current ratio (current assets ÷ current liabilities)	1.7

The quick ratio for TechSolutions, Inc., is computed as follows:

Quick Ratio = 
$$\frac{\$2,020 + \$3,400 + \$1,600}{\$5,400} = 1.3$$

The quick ratio of 1.3 indicates that the company has more than enough quick assets to pay its current liabilities in a short period of time. A quick ratio below 1.0 would indicate that the company does not have enough quick assets to cover its current liabilities.

Like the current ratio, the quick ratio is particularly useful in making comparisons across companies. To illustrate, the following selected balance sheet data (excluding ratios) were taken from recent financial statements of Panera Bread Company and Starbucks Corporation (in thousands):

	Panera Bread	Starbucks
Current assets:		
Cash and cash equivalents	\$297,141	\$1,188,600
Temporary investments	_	848,400
Accounts receivable	86,262	485,900
Inventory	19,714	1,241,500
Other current assets	75,725	435,200
Total current assets	\$478,842	\$4,199,600
Current liabilities:		
Accounts payable	\$ 9,371	\$ 389,100
Other current liabilities	268,169	1,820,700
Total current liabilities	\$277,540	\$2,209,800
Working capital (current assets – current liabilities)	\$201,302	\$1,989,800
Current ratio (current assets ÷ current liabilities)	1.7	1.9
Quick ratio (quick assets ÷ current liabilities)*	1.4	1.1

^{*}The quick ratio for each company is computed as follows: Panera Bread:  $($297,141 + $86,262) \div $277,540 = 1.4$ Starbucks:  $($1,188,600 + $848,400 + $485,900) \div $2,209,800 = 1.1$ 

Starbucks is larger than Panera Bread and has more than nine times the amount of working capital. Such size differences make working capital comparisons between companies difficult. In contrast, the current and quick ratios provide better comparisons across companies. In this example, Starbucks has a slightly higher current ratio than Panera Bread. However, Starbucks' 1.1 quick ratio reveals that it has just enough quick assets to cover its current liabilities, while Panera Bread's quick ratio of 1.4 indicates that the company has more than enough quick assets to meet its current liabilities.

#### Example Exercise 10-8 Quick Ratio



Sayer Company reported the following current assets and current liabilities for the years ended December 31, 2016 and 2015:

	2016	2015
Cash	\$1,250	\$1,000
Temporary investments	1,925	1,650
Accounts receivable	1,775	1,350
Inventory	1,900	1,700
Accounts payable	2,750	2,500

- a. Compute the quick ratio for 2016 and 2015.
- b. Interpret the company's quick ratio across the two time periods.

#### Follow My Example 10-8

```
a. December 31, 2016:
```

```
Quick Ratio = Quick Assets ÷ Current Liabilities
            = (\$1,250 + \$1,925 + \$1,775) \div \$2,750
            = 1.8
```

December 31, 2015:

December 31, 2015:  
Quick Ratio = Quick Assets 
$$\div$$
 Current Liabilities  
=  $(\$1,000 + \$1,650 + \$1,350) \div \$2,500$ 

b. The quick ratio of Sayer Company has improved from 1.6 in 2015 to 1.8 in 2016. This increase is the result of a large increase in the three types of quick assets (cash, temporary investments, and accounts receivable) compared to a relatively smaller increase in the current liability, accounts payable.

Practice Exercises: PE 10-8A, PE 10-8B

# At a Glance 10



Describe and illustrate current liabilities related to accounts payable, current portion of long-term debt, and notes payable.

**Key Points** Current liabilities are obligations that are to be paid out of current assets and are due within a short time, usually within one year. The three primary types of current liabilities are accounts payable, notes payable, and the current portion of long-term debt.

Learning Outcomes	Example Exercises	Practice Exercises	
• Identify and define the most frequently reported current liabilities on the balance sheet.			
<ul> <li>Determine the interest from interest-bearing and discounted notes payable.</li> </ul>	EE10-1	PE10-1A, 10-1B	



Determine employer liabilities for payroll, including liabilities arising from employee earnings and deductions from earnings.

**Key Points** An employer's liability for payroll is determined from employee total earnings, including overtime pay. From this amount, employee deductions are subtracted to arrive at the net pay to be paid to each employee. Most employers also incur liabilities for payroll taxes, such as social security tax, Medicare tax, federal unemployment compensation tax, and state unemployment compensation tax.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Compute the federal withholding tax from a wage bracket withholding table.</li> </ul>	EE10-2	PE10-2A, 10-2B
• Compute employee net pay, including deductions for social security and Medicare tax.	EE10-3	PE10-3A, 10-3B



Describe payroll accounting systems that use a payroll register, employee earnings records, and a general journal.

**Key Points** The payroll register is used in assembling and summarizing the data needed for each payroll period. The payroll register is supported by a detailed payroll record for each employee, called an *employee's earnings record*.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Journalize the employee's earnings, net pay, and payroll liabilities from the payroll register.</li> </ul>	EE10-4	PE10-4A, 10-4B
• Journalize the payroll tax expense.		
<ul> <li>Describe elements of a payroll system, including the employee's earnings record, payroll checks, and internal controls.</li> </ul>	EE10-5	PE10-5A, 10-5B



#### Journalize entries for employee fringe benefits, including vacation pay and pensions.

**Key Points** Fringe benefits are expenses of the period in which the employees earn the benefits. Fringe benefits are recorded by debiting an expense account and crediting a liability account.

Example Exercises	Practice Exercises
EE10-6	PE10-6A, 10-6B
EE10-6	PE10-6A, 10-6B
	EE10-6



#### Describe the accounting treatment for contingent liabilities and journalize entries for product warranties.

**Key Points** A contingent liability is a potential obligation that results from a past transaction but depends on a future event. The accounting for contingent liabilities is summarized in Exhibit 9.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe the accounting for contingent liabilities.		
<ul> <li>Journalize estimated warranty obligations and services granted under warranty.</li> </ul>	EE10-7	PE10-7A, 10-7B



#### Describe and illustrate the use of the quick ratio in analyzing a company's ability to pay its current liabilities.

**Key Points** The quick ratio is a measure of a company's ability to pay current liabilities within a short period of time. The quick ratio is computed by dividing quick assets by current liabilities. Quick assets include cash, temporary investments, accounts receivable, and other current assets that can be easily converted into cash. A quick ratio exceeding 1.0 is usually desirable.

Learning Outcomes	Example Exercises	Practice Exercises
Describe the quick ratio.		
Compute and evaluate the quick ratio.	EE10-8	PE10-8A, 10-8B

# **Key Terms**

contingent liabilities (471) current position analysis (473) defined benefit plan (469) defined contribution plan (469) employee's earnings record (465) FICA tax (460) fringe benefits (468) gross pay (458) net pay (458) payroll (457) payroll register (462) pension (468) quick assets (474) quick ratio (474)

# **Illustrative Problem**

Selected transactions of Taylor Company, completed during the fiscal year ended December 31, are as follows:

- Mar. 1. Purchased merchandise on account from Kelvin Co., \$20,000.
- Apr. 10. Issued a 60-day, 12% note for \$20,000 to Kelvin Co. on account.
- June 9. Paid Kelvin Co. the amount owed on the note of April 10.
- Aug. 1. Issued a \$50,000, 90-day note to Harold Co. in exchange for a building. Harold Co. discounted the note at 15%.
- Oct. 30. Paid Harold Co. the amount due on the note of August 1.
- Dec. 27. Journalized the entry to record the biweekly payroll. A summary of the payroll record follows:

Salary distribution:		
Sales	\$63,400	
Officers	36,600	
Office	10,000	\$110,000
Deductions:		
Social security tax	\$ 6,600	
Medicare tax	1,650	
Federal income tax withheld	17,600	
State income tax withheld	4,950	
Savings bond deductions	850	
Medical insurance deductions	1,120	32,770
Net amount		\$ 77,230

- 27. Journalized the entry to record payroll taxes for social security and Medicare from the biweekly payroll.
- 30. Issued a check in payment of liabilities for employees' federal income tax of \$17,600, social security tax of \$13,200, and Medicare tax of \$3,300.
- 31. Issued a check for \$9,500 to the pension fund trustee to fully fund the pension cost for December.
- 31. Journalized an entry to record the employees' accrued vacation pay, \$36,100.
- 31. Journalized an entry to record the estimated accrued product warranty liability, \$37,240.

#### **Instructions**

Journalize the preceding transactions.

#### **Solution**

Mar.	1	Merchandise Inventory	20,000	
		Accounts Payable—Kelvin Co.		20,000
Apr.	10	Accounts Payable—Kelvin Co.	20,000	
		Notes Payable		20,000
June	9	Notes Payable	20,000	
		Interest Expense Cash	400	20,400
		Casii		20,400
Aug.	1	Building	48,125	
		Interest Expense	1,875	
		Notes Payable		50,000
Oct.	30	Notes Payable	50,000	
Oct.	50	Cash	30,000	50,000
Dec.	27	Sales Salaries Expense	63,400	
		Officers Salaries Expense	36,600	
		Office Salaries Expense Social Security Tax Payable	10,000	6,600
		Medicare Tax Payable		1,650
		Employees Federal Income Tax Payable		17,600
		Employees State Income Tax Payable		4,950
		Bond Deductions Payable		850
		Medical Insurance Payable		1,120
		Salaries Payable		77,230
	27	Payroll Tax Expense	8,250	
		Social Security Tax Payable		6,600
		Medicare Tax Payable		1,650
	30	Employees Federal Income Tax Payable	17,600	
		Social Security Tax Payable	13,200	
		Medicare Tax Payable	3,300	
		Cash		34,100
	31	Pension Expense	9,500	
		Cash	7,500	9,500
		Fund pension cost.		
	31	Vacation Pay Expense	36,100	
	31	Vacation Pay Payable	30,100	36,100
		Accrue vacation pay.		00,100
			27.515	
	24			
	31	Product Warranty Expense Product Warranty Payable	37,240	37,240

# **Discussion Questions**

- Does a discounted note payable provide credit without interest? Discuss.
- Employees are subject to taxes withheld from their paychecks.
  - a. List the federal taxes withheld from most employee paychecks.
  - Give the title of the accounts credited by amounts withheld.
- 3. Why are deductions from employees' earnings classified as liabilities for the employer?
- 4. For each of the following payroll-related taxes, indicate whether they generally apply to (a) employees only, (b) employers only, or (c) both employees and employers:
  - 1. Federal income tax
  - 2. Medicare tax
  - 3. Social security tax
  - 4. Federal unemployment compensation tax
  - 5. State unemployment compensation tax

- 5. What are the principal reasons for using a special payroll bank account?
- 6. In a payroll system, what types of input data are referred to as (a) constants and (b) variables?
- 7. To match revenues and expenses properly, should the expense for employee vacation pay be recorded in the period during which the vacation privilege is earned or during the period in which the vacation is taken? Discuss.
- 8. Explain how a defined contribution pension plan works.
- 9. When should the liability associated with a product warranty be recorded? Discuss.
- 10. General Motors Corporation reported \$2.6 billion of product warranties in the Current Liabilities section of a recent balance sheet.

How would costs of repairing a defective product be recorded?

# **Practice Exercises**

**EE 10-1** p. 457

#### PE 10-1A Proceeds from notes payable

OBJ. 1



On October 12, Belleville Co. borrowed cash from Texas Bank by issuing a 30-day note with a face amount of \$70,000.

- a. Determine the proceeds of the note, assuming the note carries an interest rate of 6%.
- b. Determine the proceeds of the note, assuming the note is discounted at 6%.

**EE 10-1** *p. 457* 

#### PE 10-1B Proceeds from notes payable

OBJ. 1



On January 26, Nyree Co. borrowed cash from Conrad Bank by issuing a 45-day note with a face amount of \$150,000.

- a. Determine the proceeds of the note, assuming the note carries an interest rate of 10%.
- b. Determine the proceeds of the note, assuming the note is discounted at 10%.

**EE 10-2** p. 459

#### PE 10-2A Federal income tax withholding

OBJ. 2



Lily Flower's weekly gross earnings for the present week were \$2,500. Flower has two exemptions. Using the wage bracket withholding table in Exhibit 3 with a \$75 standard withholding allowance for each exemption, what is Flower's federal income tax withholding?

#### **EE 10-2** p. 459

#### PE 10-2B Federal income tax withholding

OBJ. 2



Marsha Mellow's weekly gross earnings for the present week were \$1,250. Mellow has one exemption. Using the wage bracket withholding table in Exhibit 3 with a \$75 standard withholding allowance for each exemption, what is Mellow's federal income tax withholding?

#### **EE 10-3** p. 460

#### PE 10-3A Employee net pay

OBJ. 2



Lily Flower's weekly gross earnings for the week ended October 20 were \$2,500, and her federal income tax withholding was \$517.24. Assuming the social security rate is 6% and Medicare is 1.5% of all earnings, what is Flower's net pay?

#### **EE 10-3** *p. 460*

#### PE 10-3B Employee net pay

OBJ. 2

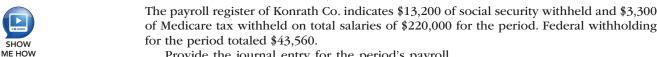


Marsha Mellow's weekly gross earnings for the week ended May 23 were \$1,250, and her federal income tax withholding was \$204.95. Assuming the social security rate is 6% and Medicare is 1.5% of all earnings, what is Mellow's net pay?

#### **EE 10-4** p. 463

#### PE 10-4A Journalize period payroll

OBJ. 3



Provide the journal entry for the period's payroll.

#### **EE 10-4** *p. 463*

#### PE 10-4B Journalize period payroll

OBJ. 3



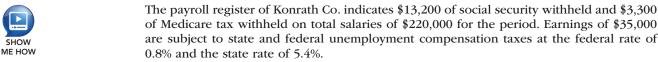
The payroll register of Longboat Co. indicates \$5,400 of social security withheld and \$1,350 of Medicare tax withheld on total salaries of \$90,000 for the period. Retirement savings withheld from employee paychecks were \$5,400 for the period. Federal withholding for the period totaled \$17,820.

Provide the journal entry for the period's payroll.

#### **EE 10-5** p. 464

#### PE 10-5A Journalize payroll tax

OBJ. 3



Provide the journal entry to record the payroll tax expense for the period.

#### **EE 10-5** p. 464

#### PE 10-5B Journalize payroll tax

OBJ. 3



The payroll register of Longboat Co. indicates \$5,400 of social security withheld and \$1,350 of Medicare tax withheld on total salaries of \$90,000 for the period. Earnings of \$10,000 are subject to state and federal unemployment compensation taxes at the federal rate of 0.8% and the state rate of 5.4%.

Provide the journal entry to record the payroll tax expense for the period.

#### **PE 10-6A** Vacation pay and pension benefits

**OBJ. 4** 

Fukushima Company provides its employees with vacation benefits and a defined contribution pension plan. Employees earned vacation pay of \$19,500 for the period. The pension plan requires a contribution to the plan administrator equal to 6% of employee salaries. Salaries were \$260,000 during the period, and the full amount due was contributed to the pension plan administrator.

Provide the journal entry for the (a) vacation pay and (b) pension benefit.



#### EE 10-6 p. 470 PE 10-6B Vacation pay and pension benefits

OBJ. 4



Regling Company provides its employees vacation benefits and a defined benefit pension plan. Employees earned vacation pay of \$35,000 for the period. The pension formula calculated a pension cost of \$201,250. Only \$175,000 was contributed to the pension plan administrator.

Provide the journal entry for the (a) vacation pay and (b) pension benefit.

#### EE 10-7 p. 472 PE 10-7A Estimated warranty liability

OBJ. 5



Chloe Co. sold \$300,000 of equipment during January under a one-year warranty. The cost to repair defects under the warranty is estimated at 5% of the sales price. On June 20, a customer required a \$90 part replacement, plus \$42 of labor under the warranty.

Provide the journal entry for (a) the estimated warranty expense on January 31 for January sales, and (b) the June 20 warranty work.

#### **EE 10-7** *p. 472*

#### PE 10-7B Estimated warranty liability

OBJ. 5



Quantas Industries sold \$325,000 of consumer electronics during July under a nine-month warranty. The cost to repair defects under the warranty is estimated at 4.5% of the sales price. On November 11, a customer was given \$220 cash under terms of the warranty.

Provide the journal entry for (a) the estimated warranty expense on July 31 for July sales, and (b) the November 11 cash payment.

#### **EE 10-8** p. 475

#### PE 10-8A Quick ratio

**OBJ. 6** 



ME HOW

ME HOW

Nabors Company reported the following current assets and liabilities for December 31 for two recent years:

	Dec. 31, Current Year	Dec. 31, Previous Year
Cash	\$ 650	\$ 680
Temporary investments	1,500	1,550
Accounts receivable	700	770
Inventory	1,250	1,400
Accounts payable	2,375	2,000

- a. Compute the quick ratio on December 31 of both years.
- b. Interpret the company's quick ratio. Is the quick ratio improving or declining?

#### **EE 10-8** p. 475

#### PE 10-8B Quick ratio

OBJ. 6



Adieu Company reported the following current assets and liabilities for December 31 for two recent years:

	Dec. 31, Current Year	Dec. 31, Previous Year
Cash	\$1,000	\$1,140
Temporary investments	1,200	1,400
Accounts receivable	800	910
Inventory	2,200	2,300
Accounts payable	1,875	2,300

- a. Compute the quick ratio on December 31 of both years.
- b. Interpret the company's quick ratio. Is the quick ratio improving or declining?

#### **Exercises**

#### **EX 10-1** Current liabilities

OBJ. 1

✓ Total current liabilities, \$1,929,750



Bon Nebo Co. sold 25,000 annual subscriptions of *Bjorn 20XX* for \$85 during December 2016. These new subscribers will receive monthly issues, beginning in January 2017. In addition, the business had taxable income of \$840,000 during the first calendar quarter of 2017. The federal tax rate is 40%. A quarterly tax payment will be made on April 12, 2017.

Prepare the Current Liabilities section of the balance sheet for Bon Nebo Co. on March 31, 2017.



#### EX 10-2 Entries for discounting notes payable

OBJ. 1

Griffin Enterprises issues a \$660,000, 45-day, 4% note to Romo Industries for merchandise inventory.

- a. Journalize Griffin Enterprises' entries to record:
  - 1. the issuance of the note.
  - 2. the payment of the note at maturity.
- b. Journalize Romo Industries' entries to record:
  - 1. the receipt of the note.
  - 2. the receipt of the payment of the note at maturity.



#### **EX 10-3** Evaluating alternative notes

OBJ. 1

A borrower has two alternatives for a loan: (1) issue a \$360,000, 60-day, 5% note or (2) issue a \$360,000, 60-day note that the creditor discounts at 5%.

- a. Calculate the amount of the interest expense for each option.
- b. Determine the proceeds received by the borrower in each situation.
- c. Which alternative is more favorable to the borrower? Explain.



#### EX 10-4 Entries for notes payable

OBJ. 1

A business issued a 45-day, 6% note for \$210,000 to a creditor on account. Journalize the entries to record (a) the issuance of the note and (b) the payment of the note at maturity, including interest.



#### EX 10-5 Entries for discounted note payable

OBJ. 1

A business issued a 60-day note for \$75,000 to a creditor on account. The note was discounted at 7%. Journalize the entries to record (a) the issuance of the note and (b) the payment of the note at maturity.



#### EX 10-6 Fixed asset purchases with note

OBJ.

On June 30, Collins Management Company purchased land for \$400,000 and a building for \$560,000, paying \$360,000 cash and issuing a 5% note for the balance, secured by a mortgage on the property. The terms of the note provide for 20 semiannual payments of \$30,000 on the principal plus the interest accrued from the date of the preceding payment. Journalize the entry to record (a) the transaction on June 30, (b) the payment of the first installment on December 31, and (c) the payment of the second installment the following June 30.



#### EX 10-7 Current portion of long-term debt

OBJ. 1

PepsiCo, Inc., reported the following information about its long-term debt in the notes to a recent financial statement (in millions):

Long-term debt is comprised of the following:

	December 31	
	<b>Current Year</b>	Previous Year
Total long term-debt	\$28,359	\$26,773
Less current portion	(4,815)	(6,205)
Long-term debt	\$23,544	\$20,568

- a. How much of the long-term debt was disclosed as a current liability on the current year's December 31 balance sheet?
- b. How much did the total current liabilities change between the preceding year and the current year as a result of the current portion of long-term debt?
- c. If PepsiCo did not issue additional long-term debt next year, what would be the total long-term debt on December 31 of the upcoming year?

✓ b. Net pay, \$1,452



✓ Administrator net pay, \$1,753.98



✓ a. (3) Total earnings, \$540,000



#### EX 10-8 Calculate payroll

OBJ. 2

An employee earns \$32 per hour and 1.5 times that rate for all hours in excess of 40 hours per week. Assume that the employee worked 55 hours during the week. Assume further that the social security tax rate was 6.0%, the Medicare tax rate was 1.5%, and federal income tax to be withheld was \$398.

- a. Determine the gross pay for the week.
- b. Determine the net pay for the week.

#### EX 10-9 Calculate payroll

OBJ. 2

Diego Company has three employees—a consultant, a computer programmer, and an administrator. The following payroll information is available for each employee:

	Consultant	Computer Programmer	Administrator
Regular earnings rate	\$3,800 per week	\$38 per hour	\$42 per hour
Overtime earnings rate*	Not applicable	2 times hourly rate	1.5 times hourly rate
Number of withholding allowances	1	2	2

^{*} For hourly employees, overtime is paid for hours worked in excess of 40 hours per week.

For the current pay period, the computer programmer worked 55 hours and the administrator worked 52 hours. The federal income tax withheld for all three employees, who are single, can be determined from the wage bracket withholding table in Exhibit 3 in the chapter. Assume further that the social security tax rate was 6.0%, the Medicare tax rate was 1.5%, and one withholding allowance is \$75.

Determine the gross pay and the net pay for each of the three employees for the current pay period.

#### EX 10-10 Summary payroll data

OBJ. 2, 3

In the following summary of data for a payroll period, some amounts have been intentionally omitted:

Earnings:	
<ol> <li>At regular rate</li> </ol>	?
2. At overtime rate	\$80,000
<ol><li>Total earnings</li></ol>	?
Deductions:	
4. Social security tax	32,400
<ol><li>Medicare tax</li></ol>	8,100
<ol><li>Income tax withheld</li></ol>	135,000
7. Medical insurance	18,900
8. Union dues	?
9. Total deductions	201,150
10. Net amount paid	338,850
Accounts debited:	
11. Factory Wages	285,000
12. Sales Salaries	?
13. Office Salaries	120,000

- a. Calculate the amounts omitted in lines (1), (3), (8), and (12).
- b. Journalize the entry to record the payroll accrual.

Earnings.

c. Journalize the entry to record the payment of the payroll.

#### **EX 10-11** Payroll tax entries

OBJ. 3

According to a summary of the payroll of Murtagh Co., \$750,000 was subject to the 6.0% social security tax and the 1.5% Medicare tax. Also, \$50,000 was subject to state and federal unemployment taxes.

- a. Calculate the employer's payroll taxes, using the following rates: state unemployment, 5.4%; federal unemployment, 0.8%.
- b. Journalize the entry to record the accrual of payroll taxes.

✓ a. \$59,350







#### EX 10-12 Payroll entries

OBJ. 3

The payroll register for Proctor Company for the week ended February 14 indicated the following:

Salaries	\$1,500,000
Social security tax withheld	90,000
Medicare tax withheld	22,500
Federal income tax withheld	300,000

In addition, state and federal unemployment taxes were calculated at the rate of 5.4% and 0.8%, respectively, on \$270,000 of salaries.

- a. Journalize the entry to record the payroll for the week of February 14.
- b. Journalize the entry to record the payroll tax expense incurred for the week of February 14.



#### EX 10-13 Payroll entries

OBJ. 3

Widmer Company had gross wages of \$240,000 during the week ended June 17. The amount of wages subject to social security tax was \$240,000, while the amount of wages subject to federal and state unemployment taxes was \$35,000. Tax rates are as follows:

Social security	6.0%
Medicare	1.5%
State unemployment	5.4%
Federal unemployment	0.8%

The total amount withheld from employee wages for federal taxes was \$48,000.

- a. Journalize the entry to record the payroll for the week of June 17.
- b. Journalize the entry to record the payroll tax expense incurred for the week of June 17.

#### EX 10-14 Payroll internal control procedures

OBJ. 3

Big Howie's Hot Dog Stand is a fast-food restaurant specializing in hot dogs and hamburgers. The store employs 8 full-time and 12 part-time workers. The store's weekly payroll averages \$5,600 for all 20 workers.

Big Howie's Hot Dog Stand uses a personal computer to assist in preparing paychecks. Each week, the store's accountant collects employee time cards and enters the hours worked into the payroll program. The payroll program calculates each employee's pay and prints a paycheck. The accountant uses a check-signing machine to sign the paychecks. Next, the restaurant's owner/manager authorizes the transfer of funds from the restaurant's regular bank account to the payroll account.

For the week of May 12, the accountant accidentally recorded 100 hours worked instead of 40 hours for one of the full-time employees.

Does Big Howie's Hot Dog Stand have internal controls in place to catch this error? If so, how will this error be detected?

#### **EX 10-15** Internal control procedures

OBJ. 3

Dave's Scooters is a small manufacturer of specialty scooters. The company employs 14 production workers and four administrative persons. The following procedures are used to process the company's weekly payroll:

- a. Whenever an employee receives a pay raise, the supervisor must fill out a wage adjustment form, which is signed by the company president. This form is used to change the employee's wage rate in the payroll system.
- b. All employees are required to record their hours worked by clocking in and out on a time clock. Employees must clock out for lunch break. Due to congestion around the time clock area at lunch time, management has not objected to having one employee clock in and out for an entire department.

(Continued)

- c. Whenever a salaried employee is terminated, Personnel authorizes Payroll to remove the employee from the payroll system. However, this procedure is not required when an hourly worker is fired. Hourly employees only receive a paycheck if their time cards show hours worked. The computer automatically drops an employee from the payroll system when that employee has six consecutive weeks with no hours worked.
- d. Paychecks are signed by using a check-signing machine. This machine is located in the main office so that it can be easily accessed by anyone needing a check signed.
- e. Dave's Scooters maintains a separate checking account for payroll checks. Each week, the total net pay for all employees is transferred from the company's regular bank account to the payroll account.

State whether each of the procedures is appropriate or inappropriate, after considering the principles of internal control. If a procedure is inappropriate, describe the appropriate procedure.

#### EX 10-16 Accrued vacation pay

OBJ. 4

A business provides its employees with varying amounts of vacation per year, depending on the length of employment. The estimated amount of the current year's vacation pay is \$42,000.

- a. Journalize the adjusting entry required on January 31, the end of the first month of the current year, to record the accrued vacation pay.
- b. How is the vacation pay reported on the company's balance sheet? When is this amount removed from the company's balance sheet?

#### EX 10-17 Pension plan entries

OBI 4

Yuri Co. operates a chain of gift shops. The company maintains a defined contribution pension plan for its employees. The plan requires quarterly installments to be paid to the funding agent, Whims Funds, by the fifteenth of the month following the end of each quarter. Assume that the pension cost is \$365,000 for the quarter ended December 31.

- a. Journalize the entries to record the accrued pension liability on December 31 and the payment to the funding agent on January 15.
- b. How does a defined contribution plan differ from a defined benefit plan?

#### EX 10-18 Defined benefit pension plan terms

OBJ. 4

In a recent year's financial statements, Procter & Gamble showed an unfunded pension liability of \$5,599 million and a periodic pension cost of \$434 million.

Explain the meaning of the \$5,599 million unfunded pension liability and the \$434 million periodic pension cost.

#### EX 10-19 Accrued product warranty

OBJ. 5

Lowe Manufacturing Co. warrants its products for one year. The estimated product warranty is 4% of sales. Assume that sales were \$560,000 for January. In February, a customer received warranty repairs requiring \$140 of parts and \$95 of labor.

- a. Journalize the adjusting entry required at January 31, the end of the first month of the current fiscal year, to record the accrued product warranty.
- b. Journalize the entry to record the warranty work provided in February.

#### EX 10-20 Accrued product warranty

OBJ. 5

/!-- --- !II! - -- -\

General Motors Corporation (GM) disclosed estimated product warranty payable for comparative years as follows:

	(in millions)	
	Year 2	Year 1
Current estimated product warranty payable	\$3,059	\$2,884
Noncurrent estimated product warranty payable	4,327	4,147
Total	\$7,386	\$7,031











Presume that GM's sales were \$135,592 million in Year 2 and that the total paid on warranty claims during Year 2 was \$3,000 million.

- a. Why are short- and long-term estimated warranty liabilities separately disclosed?
- b. Provide the journal entry for the Year 2 product warranty expense.
- c. What two conditions must be met in order for a product warranty liability to be reported in the financial statements?

#### **EX 10-21** Contingent liabilities

OBJ. 5

Several months ago, Ayers Industries Inc. experienced a hazardous materials spill at one of its plants. As a result, the Environmental Protection Agency (EPA) fined the company \$240,000. The company is contesting the fine. In addition, an employee is seeking \$220,000 in damages related to the spill. Lastly, a homeowner has sued the company for \$310,000. The homeowner lives 35 miles from the plant but believes that the incident has reduced the home's resale value by \$310,000.

Ayers' legal counsel believes that it is probable that the EPA fine will stand. In addition, counsel indicates that an out-of-court settlement of \$125,000 has recently been reached with the employee. The final papers will be signed next week. Counsel believes that the homeowner's case is much weaker and will be decided in favor of Ayers. Other litigation related to the spill is possible, but the damage amounts are uncertain.

- a. Journalize the contingent liabilities associated with the hazardous materials spill. Use the account "Damage Awards and Fines" to recognize the expense for the period.
- b. Prepare a note disclosure relating to this incident.

#### EX 10-22 Quick ratio

OBJ. 6

Gmeiner Co. had the following current assets and liabilities on December 31 of two recent years:

	Current Year	Previous Year
Current assets:		
Cash	\$ 486,000	\$ 500,000
Accounts receivable	210,000	200,000
Inventory	375,000	350,000
Total current assets	\$1,071,000	\$1,050,000
Current liabilities:		
Current portion of long-term debt	\$ 145,000	\$ 110,000
Accounts payable	175,000	150,000
Accrued and other current liabilities	260,000	240,000
Total current liabilities	\$ 580,000	\$ 500,000

- a. Determine the quick ratio for December 31 of both years.
- b. Interpret the change in the quick ratio between the two balance sheet dates.

#### EX 10-23 Quick ratio

OBJ. 6

Dell, Inc.

The current assets and current liabilities for Apple Inc. and Dell, Inc., are as follows at the end of a recent fiscal period:

Apple Inc.

	(in millions)	(in millions)
Current assets:		
Cash and cash equivalents	\$10,746	\$12,569
Short-term investments	18,383	208
Accounts receivable	21,275	9,842
Inventories	791	1,382
Other current assets*	6,458	3,967
Total current assets	\$57,653	\$27,968
Current liabilities:		
Accounts payable	\$32,589	\$15,223
Accrued and other current liabilities	5,953	8,216
Total current liabilities	\$38,542	\$23,439

^{*}These represent prepaid expense and other nonquick current assets.

(Continued)

✓ a. Current year: 1.2



✓ a. Apple, 1.3

- a. Determine the quick ratio for both companies. (Round to one decimal place.)
- b. Interpret the quick ratio difference between the two companies.

### **Problems: Series A**

#### General Ledger



#### PR 10-1A Liability transactions

**OBJ. 1, 5** 

The following items were selected from among the transactions completed by Pioneer Co. during the current year:

- Mar. 1. Purchased merchandise on account from Galston Co., \$360,000, terms n/30.
  - 31. Issued a 30-day, 5% note for \$360,000 to Galston Co., on account.
- Apr. 30. Paid Galston Co. the amount owed on the note of March 31.
- June 1. Borrowed \$180,000 from Pilati Bank, issuing a 45-day, 4% note.
- July 1. Purchased tools by issuing a \$210,000, 60-day note to Zegna Co., which
  discounted the note at the rate of 7%.
  - 16. Paid Pilati Bank the interest due on the note of June 1 and renewed the loan by issuing a new 30-day, 6.5% note for \$180,000. (Journalize both the debit and credit to the notes payable account.)
- Aug. 15. Paid Pilati Bank the amount due on the note of July 16.
  - 30. Paid Zegna Co. the amount due on the note of July 1.
- Dec. 1. Purchased office equipment from Taylor Co. for \$500,000, paying \$120,000 and issuing a series of ten 6% notes for \$38,000 each, coming due at 30-day intervals.
  - 22. Settled a product liability lawsuit with a customer for \$310,000, payable in January. Pioneer accrued the loss in a litigation claims payable account.
  - 31. Paid the amount due Taylor Co. on the first note in the series issued on December 1.

#### **Instructions**

- 1. Journalize the transactions.
- 2. Journalize the adjusting entry for each of the following accrued expenses at the end of the current year:
  - a. Product warranty cost, \$27,500.
  - b. Interest on the nine remaining notes owed to Taylor Co.

#### PR 10-2A Entries for payroll and payroll taxes

OBJ. 2, 3

✓ 1. (b) Dr. Payroll Tax Expense, \$52,795

General Ledger

The following information about the payroll for the week ended December 30 was obtained from the records of Qualitech Co.:

Salaries:		Deductions:	
Sales salaries	\$350,000	Income tax withheld	\$118,800
Warehouse salaries	180,000	Social security tax withheld	40,500
Office salaries	_145,000	Medicare tax withheld	10,125
	\$675,000	U.S. savings bonds	14,850
		Group insurance	12,150
			\$196,425

Tax rates assumed:

Social security, 6% Medicare, 1.5%

State unemployment (employer only), 5.4%

Federal unemployment (employer only), 0.8%

#### **Instructions**

- 1. Assuming that the payroll for the last week of the year is to be paid on December 31, journalize the following entries:
  - a. December 30, to record the payroll.
  - b. December 30, to record the employer's payroll taxes on the payroll to be paid on December 31. Of the total payroll for the last week of the year, \$35,000 is subject to unemployment compensation taxes.
- 2. Assuming that the payroll for the last week of the year is to be paid on January 5 of the following fiscal year, journalize the following entries:
  - a. December 30, to record the payroll.
  - b. January 5, to record the employer's payroll taxes on the payroll to be paid on January 5. Because it is a new fiscal year, all \$675,000 in salaries is subject to unemployment compensation taxes.

#### PR 10-3A Wage and tax statement data on employer FICA tax

**OBJ. 2, 3** 

X

✓ 2. (e) \$28,574.96

Ehrlich Co. began business on January 2, 2015. Salaries were paid to employees on the last day of each month, and social security tax, Medicare tax, and federal income tax were withheld in the required amounts. An employee who is hired in the middle of the month receives half the monthly salary for that month. All required payroll tax reports were filed, and the correct amount of payroll taxes was remitted by the company for the calendar year. Early in 2016, before the Wage and Tax Statements (Form W-2) could be prepared for distribution to employees and for filing with the Social Security Administration, the employees' earnings records were inadvertently destroyed.

None of the employees resigned or were discharged during the year, and there were no changes in salary rates. The social security tax was withheld at the rate of 6.0% and Medicare tax at the rate of 1.5%. Data on dates of employment, salary rates, and employees' income taxes withheld, which are summarized as follows, were obtained from personnel records and payroll records:

Employee	Date First Employed	Monthly Salary	Monthly Income Tax Withheld
Arnett	Nov. 16	\$ 5,500	\$ 944
Cruz	Jan. 2	4,800	833
Edwards	Oct. 1	8,000	1,592
Harvin	Dec. 1	6,000	1,070
Nicks	Feb. 1	10,000	2,350
Shiancoe	Mar. 1	11,600	2,600
Ward	Nov. 16	5,220	876

#### Instructions

1. Calculate the amounts to be reported on each employee's Wage and Tax Statement (Form W-2) for 2015, arranging the data in the following form:

	Gross	Federal Income	Social Security	Medicare
Employee	Earnings	Tax Withheld	Tax Withheld	Tax Withheld

2. Calculate the following employer payroll taxes for the year: (a) social security; (b) Medicare; (c) state unemployment compensation at 5.4% on the first \$10,000 of each employee's earnings; (d) federal unemployment compensation at 0.8% on the first \$10,000 of each employee's earnings; (e) total.

#### PR 10-4A Payroll register

**OBJ. 2, 3** 

✓ 1. Total net pay \$15,424.12



The following data for Throwback Industries Inc. relate to the payroll for the week ended December 9, 2016:

Employee	Hours Worked	Hourly Rate	Weekly Salary	Federal Income Tax	U.S. Savings Bonds
Aaron	46	\$68.00		\$750.20	\$100
Cobb	41	62.00		537.68	110
Clemente	48	70.00		832.64	120
DiMaggio	35	56.00		366.04	0
Griffey, Jr.	45	62.00		641.84	130
Mantle			\$1,800	342.45	120
Robinson	36	54.00		382.56	130
Williams			2,000	398.24	125
Vaughn	42	62.00		584.72	50

Employees Mantle and Williams are office staff, and all of the other employees are sales personnel. All sales personnel are paid 1½ times the regular rate for all hours in excess of 40 hours per week. The social security tax rate is 6.0%, and Medicare tax is 1.5% of each employee's annual earnings. The next payroll check to be used is No. 901.

#### **Instructions**

- 1. Prepare a payroll register for Throwback Industries Inc. for the week ended December 9, 2016. Use the following columns for the payroll register: Employee, Total Hours, Regular Earnings, Overtime Earnings, Total Earnings, Social Security Tax, Medicare Tax, Federal Income Tax, U.S. Savings Bonds, Total Deductions, Net Pay, Ck. No., Sales Salaries Expense, and Office Salaries Expense.
- 2. Journalize the entry to record the payroll for the week.

#### PR 10-5A Payroll accounts and year-end entries

OBJ. 2, 3, 4

The following accounts, with the balances indicated, appear in the ledger of Garcon Co. on December 1 of the current year:

211	Salaries Payable	_	218 Bond Deductions Payable \$	3,400
212	Social Security Tax Payable	\$ 9,273	219 Medical Insurance Payable	27,000
213	Medicare Tax Payable	2,318	411 Operations Salaries Expense	950,000
214	Employees Federal Income Tax Payable	15,455	511 Officers Salaries Expense	600,000
215	Employees State Income Tax Payable	13,909	512 Office Salaries Expense	150,000
216	State Unemployment Tax Payable	1,400	519 Payroll Tax Expense	137,951
217	Federal Unemployment Tax Payable	500		

The following transactions relating to payroll, payroll deductions, and payroll taxes occurred during December:

- Dec. 2. Issued Check No. 410 for \$3,400 to Jay Bank to purchase U.S. savings bonds for employees.
  - 2. Issued Check No. 411 to Jay Bank for \$27,046 in payment of \$9,273 of social security tax, \$2,318 of Medicare tax, and \$15,455 of employees' federal income tax due.
  - 13. Journalized the entry to record the biweekly payroll. A summary of the payroll record follows:

Salary distribution:		
Operations	\$43,200	
Officers	27,200	
Office	6,800	\$77,200
Deductions:		
Social security tax	\$ 4,632	
Medicare tax	1,158	
Federal income tax withheld	15,440	
State income tax withheld	3,474	
Savings bond deductions	1,700	
Medical insurance deductions	4,500	30,904
Net amount		\$46,296

General Ledger

- Dec. 13. Issued Check No. 420 in payment of the net amount of the biweekly payroll.
  - 13. Journalized the entry to record payroll taxes on employees' earnings of December 13: social security tax, \$4,632; Medicare tax, \$1,158; state unemployment tax, \$350; federal unemployment tax, \$125.
  - 16. Issued Check No. 424 to Jay Bank for \$27,020, in payment of \$9,264 of social security tax, \$2,316 of Medicare tax, and \$15,440 of employees' federal income tax due.
  - 19. Issued Check No. 429 to Sims-Walker Insurance Company for \$31,500 in payment of the semiannual premium on the group medical insurance policy.
  - 27. Journalized the entry to record the biweekly payroll. A summary of the payroll record follows:

00
40
60

- 27. Issued Check No. 541 in payment of the net amount of the biweekly payroll.
- 27. Journalized the entry to record payroll taxes on employees' earnings of December 27: social security tax, \$4,668; Medicare tax, \$1,167; state unemployment tax, \$225; federal unemployment tax, \$75.
- 27. Issued Check No. 543 for \$20,884 to State Department of Revenue in payment of employees' state income tax due on December 31.
- 31. Issued Check No. 545 to Jay Bank for \$3,400 to purchase U.S. savings bonds for employees.
- 31. Paid \$45,000 to the employee pension plan. The annual pension cost is \$60,000. (Record both the payment and unfunded pension liability.)

#### **Instructions**

- 1. Journalize the transactions.
- 2. Journalize the following adjusting entries on December 31:
  - a. Salaries accrued: operations salaries, \$8,560; officers salaries, \$5,600; office salaries, \$1,400. The payroll taxes are immaterial and are not accrued.
  - b. Vacation pay, \$15,000.

## **Problems: Series B**

#### PR 10-1B Liability transactions

OBJ. 1. 5

The following items were selected from among the transactions completed by Aston Martin Inc. during the current year:

- Apr. 15. Borrowed \$225,000 from Audi Company, issuing a 30-day, 6% note for that amount.
- May 1. Purchased equipment by issuing a \$320,000, 180-day note to Spyder Manufacturing Co., which discounted the note at the rate of 6%.
  - 15. Paid Audi Company the interest due on the note of April 15 and renewed the loan by issuing a new 60-day, 8% note for \$225,000. (Record both the debit and credit to the notes payable account.)
- July 14. Paid Audi Company the amount due on the note of May 15.

(Continued)





- Aug. 16. Purchased merchandise on account from Exige Co., \$90,000, terms, n/30.
- Sept.15. Issued a 45-day, 6% note for \$90,000 to Exige Co., on account.
- Oct. 28. Paid Spyder Manufacturing Co. the amount due on the note of May 1.
  - 30. Paid Exige Co. the amount owed on the note of September 15.
- Nov. 16. Purchased store equipment from Gallardo Co. for \$450,000, paying \$50,000 and issuing a series of twenty 9% notes for \$20,000 each, coming due at 30-day intervals.
- Dec. 16. Paid the amount due Gallardo Co. on the first note in the series issued on November 16.
  - 28. Settled a personal injury lawsuit with a customer for \$87,500, to be paid in January. Aston Martin Inc. accrued the loss in a litigation claims payable account.

#### **Instructions**

- 1. Journalize the transactions.
- 2. Journalize the adjusting entry for each of the following accrued expenses at the end of the current year:
  - a. Product warranty cost, \$26,800.
  - b. Interest on the 19 remaining notes owed to Gallardo Co.

#### PR 10-2B Entries for payroll and payroll taxes

OBJ. 2, 3

The following information about the payroll for the week ended December 30 was obtained from the records of Saine Co.:

✓ 1. (b) Dr. Payroll Tax Expense, \$90,735

General Ledger

Salaries:		Deductions:	
Sales salaries	\$ 625,000	Income tax withheld	\$232,260
Warehouse salaries	240,000	Social security tax withheld	71,100
Office salaries	320,000	Medicare tax withheld	17,775
	\$1,185,000	U.S. savings bonds	35,500
		Group insurance	53,325
			\$409,960

Tax rates assumed:

Social security, 6%

Medicare, 1.5%

State unemployment (employer only), 5.4%

Federal unemployment (employer only), 0.8%

#### **Instructions**

- 1. Assuming that the payroll for the last week of the year is to be paid on December 31, journalize the following entries:
  - a. December 30, to record the payroll.
  - b. December 30, to record the employer's payroll taxes on the payroll to be paid on December 31. Of the total payroll for the last week of the year, \$30,000 is subject to unemployment compensation taxes.
- 2. Assuming that the payroll for the last week of the year is to be paid on January 4 of the following fiscal year, journalize the following entries:
  - a. December 30, to record the payroll.
  - b. January 4, to record the employer's payroll taxes on the payroll to be paid on January 4. Because it is a new fiscal year, all \$1,185,000 in salaries is subject to unemployment compensation taxes.

#### PR 10-3B Wage and tax statement data and employer FICA tax

OBJ. 2, 3

Jocame Inc. began business on January 2, 2015. Salaries were paid to employees on the last day of each month, and social security tax, Medicare tax, and federal income tax were withheld in the required amounts. An employee who is hired in the middle of the month receives half the monthly salary for that month. All required payroll tax reports were filed, and the correct amount of payroll taxes was remitted by the company for the

√ 2. (e) \$25,136.13



calendar year. Early in 2016, before the Wage and Tax Statements (Form W-2) could be prepared for distribution to employees and for filing with the Social Security Administration, the employees' earnings records were inadvertently destroyed.

None of the employees resigned or were discharged during the year, and there were no changes in salary rates. The social security tax was withheld at the rate of 6.0% and Medicare tax at the rate of 1.5% on salary. Data on dates of employment, salary rates, and employees' income taxes withheld, which are summarized as follows, were obtained from personnel records and payroll records:

Employee	Date First Employed	Monthly Salary	Monthly Income Tax Withheld
Addai	July 16	\$ 8,160	\$1,704
Kasay	June 1	3,600	533
McGahee	Feb. 16	6,420	1,238
Moss	Jan. 1	4,600	783
Stewart	Dec. 1	4,500	758
Tolbert	Nov. 16	3,250	446
Wells	May 1	10,500	2,359

#### **Instructions**

1. Calculate the amounts to be reported on each employee's Wage and Tax Statement (Form W-2) for 2015, arranging the data in the following form:

	Gross	Federal Income	Social Security	Medicare
Employee	Earnings	Tax Withheld	Tax Withheld	Tax Withheld

2. Calculate the following employer payroll taxes for the year: (a) social security; (b) Medicare; (c) state unemployment compensation at 5.4% on the first \$10,000 of each employee's earnings; (d) federal unemployment compensation at 0.8% on the first \$10,000 of each employee's earnings; (e) total.

#### PR 10-4B Payroll register

OBJ. 2, 3

The following data for Flexco Inc. relate to the payroll for the week ended December 9, 2016:

Employee	Hours Worked	Hourly Rate	Weekly Salary	Federal Income Tax	U.S. Savings Bonds
Carlton	52	\$50.00		\$667.00	\$ 60
Grove			\$4,000	860.00	100
Johnson	36	52.00		355.68	0
Koufax	45	58.00		578.55	44
Maddux	37	45.00		349.65	62
Seaver			3,200	768.00	120
Spahn	46	52.00		382.20	0
Winn	48	50.00		572.00	75
Young	43	54.00		480.60	80

Employees Grove and Seaver are office staff, and all of the other employees are sales personnel. All sales personnel are paid 1½ times the regular rate for all hours in excess of 40 hours per week. The social security tax rate is 6.0% of each employee's annual earnings, and Medicare tax is 1.5% of each employee's annual earnings. The next payroll check to be used is No. 328.

#### **Instructions**

- 1. Prepare a payroll register for Flexco Inc. for the week ended December 9, 2016. Use the following columns for the payroll register: Employee, Total Hours, Regular Earnings, Overtime Earnings, Total Earnings, Social Security Tax, Medicare Tax, Federal Income Tax, U.S. Savings Bonds, Total Deductions, Net Pay, Ck. No., Sales Salaries Expense, and Office Salaries Expense.
- 2. Journalize the entry to record the payroll for the week.

✓ 1. Total net pay, \$16,592.58



#### PR 10-5B Payroll accounts and year-end entries

OBJ. 2, 3, 4

General Ledger

The following accounts, with the balances indicated, appear in the ledger of Codigo Co. on December 1 of the current year:

101 Salaries Payable	_	108 Bond Deductions Payable	\$ 2,300
102 Social Security Tax Payable	\$2,913	109 Medical Insurance Payable	2,520
103 Medicare Tax Payable	728	201 Sales Salaries Expense	700,000
104 Employees Federal Income Tax Payable	4,490	301 Officers Salaries Expense	340,000
105 Employees State Income Tax Payable	4,078	401 Office Salaries Expense	125,000
106 State Unemployment Tax Payable	1,260	408 Payroll Tax Expense	59,491
107 Federal Unemployment Tax Payable	360		

The following transactions relating to payroll, payroll deductions, and payroll taxes occurred during December:

- Dec. 1. Issued Check No. 815 to Aberderas Insurance Company for \$2,520, in payment of the semiannual premium on the group medical insurance policy.
  - 1. Issued Check No. 816 to Alvarez Bank for \$8,131, in payment for \$2,913 of social security tax, \$728 of Medicare tax, and \$4,490 of employees' federal income tax due.
  - 2. Issued Check No. 817 for \$2,300 to Alvarez Bank to purchase U.S. savings bonds for employees.
  - 12. Journalized the entry to record the biweekly payroll. A summary of the payroll record follows:

Salary distribution:		
Sales	\$14,500	
Officers	7,100	
Office	2,600	\$24,200
Deductions:		
Social security tax	\$ 1,452	
Medicare tax	363	
Federal income tax withheld	4,308	
State income tax withheld	1,089	
Savings bond deductions	1,150	
Medical insurance deductions	420	8,782
Net amount		\$15,418

- 12. Issued Check No. 822 in payment of the net amount of the biweekly payroll.
- 12. Journalized the entry to record payroll taxes on employees' earnings of December 12: social security tax, \$1,452; Medicare tax, \$363; state unemployment tax, \$315; federal unemployment tax, \$90.
- 15. Issued Check No. 830 to Alvarez Bank for \$7,938, in payment of \$2,904 of social security tax, \$726 of Medicare tax, and \$4,308 of employees' federal income tax due.
- 26. Journalized the entry to record the biweekly payroll. A summary of the payroll record follows:

Salary distribution:		
Sales	\$14,250	
Officers	7,250	
Office	2,750	\$24,250
Deductions:		
Social security tax	\$ 1,455	
Medicare tax	364	
Federal income tax withheld	4,317	
State income tax withheld	1,091	
Savings bond deductions	1,150	8,377
Net amount		\$15,873

- 26. Issued Check No. 840 for the net amount of the biweekly payroll.
- 26. Journalized the entry to record payroll taxes on employees' earnings of December 26: social security tax, \$1,455; Medicare tax, \$364; state unemployment tax, \$150; federal unemployment tax, \$40.

Calamidistribution

- Dec. 30. Issued Check No. 851 for \$6,258 to State Department of Revenue, in payment of employees' state income tax due on December 31.
  - 30. Issued Check No. 852 to Alvarez Bank for \$2,300 to purchase U.S. savings bonds for employees.
  - 31. Paid \$55,400 to the employee pension plan. The annual pension cost is \$65,500. (Record both the payment and the unfunded pension liability.)

#### Instructions

- 1. Journalize the transactions.
- 2. Journalize the following adjusting entries on December 31:
  - a. Salaries accrued: sales salaries, \$4,275; officers salaries, \$2,175; office salaries, \$825. The payroll taxes are immaterial and are not accrued.
  - b. Vacation pay, \$13,350.

## **Comprehensive Problem 3**

√ 5. Total assets, \$3,569,300

General Ledger

Selected transactions completed by Kornett Company during its first fiscal year ended December 31, 2016, were as follows:

- Jan. 3. Issued a check to establish a petty cash fund of \$4,500.
- Feb. 26. Replenished the petty cash fund, based on the following summary of petty cash receipts: office supplies, \$1,680; miscellaneous selling expense, \$570; miscellaneous administrative expense, \$880.
- Apr. 14. Purchased \$31,300 of merchandise on account, terms 1/10, n/30. The perpetual inventory system is used to account for inventory.
- May 13. Paid the invoice of April 14 after the discount period had passed.
  - 17. Received cash from daily cash sales for \$21,200. The amount indicated by the cash register was \$21,240.
- June 2. Received a 60-day, 8% note for \$180,000 on the Ryanair account.
- Aug. 1. Received amount owed on June 2 note, plus interest at the maturity date.
  - 24. Received \$7,600 on the Finley account and wrote off the remainder owed on a \$9,000 accounts receivable balance. (The allowance method is used in accounting for uncollectible receivables.)
- Sept.15. Reinstated the Finley account written off on August 24 and received \$1,400 cash in full payment.
  - 15. Purchased land by issuing a \$670,000, 90-day note to Zahorik Co., which discounted it at 9%.
- Oct. 17. Sold office equipment in exchange for \$135,000 cash plus receipt of a \$100,000, 90-day, 9% note. The equipment had a cost of \$320,000 and accumulated depreciation of \$64,000 as of October 17.
- Nov. 30. Journalized the monthly payroll for November, based on the following data:

Sal	Salaries Deductions			
Sales salaries	\$135,000 I	les salaries \$135,000 Income tax withheld		\$39,266
Office salaries	77,250	Social security tax withheld	12,735	
	\$212,250			
Unem	nployment tax rates	S:		
St	ate unemployment	t 5.4%		
Fe	deral unemployme	ent 0.8%		
Amou	unt subject to unen	nployment taxes:		
St	ate unemployment	t \$5,000		
Fe	deral unemployme	ent 5,000		

30. Journalized the employer's payroll taxes on the payroll.

(Continued)

- Dec. 14. Journalized the payment of the September 15 note at maturity.
  - 31. The pension cost for the year was \$190,400, of which \$139,700 was paid to the pension plan trustee.

#### **Instructions**

- 1. Journalize the selected transactions.
- 2. Based on the following data, prepare a bank reconciliation for December of the current year:
  - a. Balance according to the bank statement at December 31, \$283,000.
  - b. Balance according to the ledger at December 31, \$245,410.
  - c. Checks outstanding at December 31, \$68,540.
  - d. Deposit in transit, not recorded by bank, \$29,500.
  - e. Bank debit memo for service charges, \$750.
  - f. A check for \$12,700 in payment of an invoice was incorrectly recorded in the accounts as \$12,000.
- 3. Based on the bank reconciliation prepared in (2), journalize the entry or entries to be made by Kornett Company.
- 4. Based on the following selected data, journalize the adjusting entries as of December 31 of the current year:
  - a. Estimated uncollectible accounts at December 31, \$16,000, based on an aging of accounts receivable. The balance of Allowance for Doubtful Accounts at December 31 was \$2,000 (debit).
  - b. The physical inventory on December 31 indicated an inventory shrinkage of \$3,300.
  - c. Prepaid insurance expired during the year, \$22,820.
  - d. Office supplies used during the year, \$3,920.
  - e. Depreciation is computed as follows:

Asset	Cost	Residual Value	Acquisition Date	Useful Life in Years	Depreciation Method Used
Buildings	\$900,000	\$ 0	January 2	50	Double-declining-balance
Office Equip.	246,000	26,000	January 3	5	Straight-line
Store Equip.	112,000	12,000	July 1	10	Straight-line

- f. A patent costing \$48,000 when acquired on January 2 has a remaining legal life of 10 years and is expected to have value for eight years.
- g. The cost of mineral rights was \$546,000. Of the estimated deposit of 910,000 tons of ore, 50,000 tons were mined and sold during the year.
- h. Vacation pay expense for December, \$10,500.
- i. A product warranty was granted beginning December 1 and covering a one-year period. The estimated cost is 4% of sales, which totaled \$1,900,000 in December.
- j. Interest was accrued on the note receivable received on October 17.
- 5. Based on the following information and the post-closing trial balance that follows, prepare a balance sheet in report form at December 31 of the current year:

The merchandise inventory is stated at cost by the LIFO method. The product warranty payable is a current liability.

Vacation pay payable:

Current liability \$7,140 Long-term liability 3,360

The unfunded pension liability is a long-term liability.

Notes payable:

Current liability \$ 70,000 Long-term liability 630,000

#### Kornett Company Post-Closing Trial Balance December 31, 2016

	Debit Balances	Credit Balances
Petty Cash	4,500	
Cash	243,960	
Notes Receivable	100,000	
Accounts Receivable	470,000	
Allowance for Doubtful Accounts		16,000
Merchandise Inventory	320,000	
Interest Receivable	1,875	
Prepaid Insurance	45,640	
Office Supplies	13,400	
Land	654,925	
Buildings	900,000	
Accumulated Depreciation—Buildings		36,000
Office Equipment	246,000	
Accumulated Depreciation—Office Equipment		44,000
Store Equipment	112,000	
Accumulated Depreciation—Store Equipment		5,000
Mineral Rights	546,000	
Accumulated Depletion		30,000
Patents	42,000	
Social Security Tax Payable		25,470
Medicare Tax Payable		4,710
Employees Federal Income Tax Payable		40,000
State Unemployment Tax Payable		270
Federal Unemployment Tax Payable		40
Salaries Payable		157,000
Accounts Payable		131,600
Interest Payable		28,000
Product Warranty Payable		76,000
Vacation Pay Payable		10,500
Unfunded Pension Liability		50,700
Notes Payable		700,000
Common Stock		500,000
Retained Earnings		1,845,010
	3,700,300	3,700,300

# **Cases & Projects**

# CP 10-1 Ethics and professional conduct in business Tonya Latirno is a certified public accountant (CPA) a



Tonya Latirno is a certified public accountant (CPA) and staff accountant for Kennedy and Kennedy, a local CPA firm. It had been the policy of the firm to provide a holiday bonus equal to two weeks' salary to all employees. The firm's new management team announced on November 15 that a bonus equal to only one week's salary would be made available to employees this year. Tonya thought that this policy was unfair because she and her coworkers planned on the full two-week bonus. The two-week bonus had been given for 10 straight years, so it seemed as though the firm had breached an implied commitment. Thus, Tonya decided that she would make up the lost bonus week by working an extra six hours of overtime per week over the next five weeks until the end of the year. Kennedy and Kennedy's policy is to pay overtime at 150% of straight time.

Tonya's supervisor was surprised to see overtime being reported, because there is generally very little additional or unusual client service demands at the end of the calendar year. However, the overtime was not questioned, because firm employees are on the "honor system" in reporting their overtime.

Discuss whether the firm is acting in an ethical manner by changing the bonus. Is Tonya behaving in an ethical manner?

#### CP 10-2 Recognizing pension expense

The annual examination of Felton Company's financial statements by its external public accounting firm (auditors) is nearing completion. The following conversation took place between the controller of Felton Company (Francie) and the audit manager from the public accounting firm (Sumana):

Sumana: You know, Francie, we are about to wrap up our audit for this fiscal year. Yet, there is one item still to be resolved. Francie: What's that?

Sumana: Well, as you know, at the beginning of the year, Felton began a defined benefit pension plan. This plan promises your employees an annual payment when they retire, using a formula based on their salaries at retirement and their years of service. I believe that a pension expense should be recognized this year, equal to the amount of pension earned by your employees.

Francie: Wait a minute. I think you have it all wrong. The company doesn't have a pension expense until it actually pays the pension in cash when the employee retires. After all, some of these employees may not reach retirement, and if they don't, the company doesn't owe them anything.

Sumana: You're not really seeing this the right way. The pension is earned by your employees during their working years. You actually make the payment much later—when they retire. It's like one long accrual—much like incurring wages in one period and paying them in the next. Thus, I think that you should recognize the expense in the period the pension is earned by the employees.

Francie: Let me see if I've got this straight. I should recognize an expense this period for something that may or may not be paid to the employees in 20 or 30 years, when they finally retire. How am I supposed to determine what the expense is for the current year? The amount of the final retirement depends on many uncertainties: salary levels, employee longevity, mortality rates, and interest earned on investments to fund the pension. I don't think that an amount can be determined, even if I accepted your arguments.



Evaluate Sumana's position. Is she right or is Francie correct?

#### CP 10-3 Ethics and professional conduct in business

Marvin Turner was discussing summer employment with Tina Song, president of Motown Construction Service:

Tina: I'm glad that you're thinking about joining us for the summer. We could certainly use the help.

Marvin: Sounds good. I enjoy outdoor work, and I could use the money to help with next year's school expenses.

Tina: I've got a plan that can help you out on that. As you know, I'll pay you \$14 per hour, but in addition, I'd like to pay you with cash. Since you're only working for the summer, it really doesn't make sense for me to go to the trouble of formally putting you on our payroll system. In fact, I do some jobs for my clients on a strictly cash basis, so it would be easy to just pay you that way.

Marvin: Well, that's a bit unusual, but I guess money is money.

Tina: Yeah, not only that, it's tax-free!

Marvin: What do you mean?

Tina: Didn't you know? Any money that you receive in cash is not reported to the IRS on a W-2 form; therefore, the IRS doesn't know about the income—hence, it's the same as tax-free earnings.

- Why does Tina Song want to conduct business transactions using cash (not check or credit card)?
- b. How should Marvin respond to Tina's suggestion?

#### CP 10-4 Payroll forms

#### **Group Project**

Payroll accounting involves the use of government-supplied forms to account for payroll taxes. Three common forms are the W-2, Form 940, and Form 941. Form a team with three of your classmates and retrieve copies of each of these forms. They may be obtained from a local IRS office, a library, or downloaded from the Internet at www.irs.gov (go to forms and publications).

#### Briefly describe the purpose of each of the three forms.

#### CP 10-5 Contingent liabilities

Altria Group, Inc., has more than 12 pages dedicated to describing contingent liabilities in the notes to recent financial statements. These pages include extensive descriptions of multiple contingent liabilities. Use the Internet to research Altria Group, Inc., at www.altria.com.

- a. What are the major business units of Altria Group?
- b. Based on your understanding of this company, why would Altria Group require more than 12 pages of contingency disclosure?



Internet Project





# Corporations: Organization, Stock Transactions, and Dividends

# Google

If you purchase a share of stock from **Google**, you own a small interest in the company. You may request a Google stock certificate as an indication of your ownership.

Google is one of the most visible companies on the Internet. Many of us cannot visit the Web without using Google to power a search or to retrieve our e-mail using Google's gmail. Yet Google's Internet tools are free to online browsers. Google generates most of its revenue through online advertising.

Purchasing a share of stock from Google may be a great gift idea for the "hard-to-shop-for person." However, a stock certificate represents more than just a picture that you can frame. In fact, the stock certificate is a document that reflects legal ownership of the future financial prospects of Google. In addition, as a shareholder, it represents your claim against the assets and earnings of the corporation.

If you are purchasing Google stock as an investment, you should analyze Google's financial statements and management's plans for the future. For example, Google first offered its stock to the public on August 19, 2004, for \$100 per share. Google's stock recently sold for more than \$1,000 per share, even though it pays no dividends. In addition, Google recently expanded into developing and offering free software platforms for mobile devices such as cell phones. For example, your cell phone may use Google's Android™ operating system. So, should you purchase Google stock?

This chapter describes and illustrates the nature of corporations, including the accounting for stock and dividends. This discussion will aid you in making decisions such as whether or not to buy stock in a company.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe the nature of the corporate form of organization. Nature of a Corporation Characteristics of a Corporation Forming a Corporation	
Describe and illustrate the characteristics of stock, classes of stock, and entries for issuing stock. Paid-In Capital from Issuing Stock Characteristics of Stock Classes of Stock Issuing Stock Premium on Stock No-Par Stock	EE 11-1 EE 11-2 EE 11-2 EE 11-2
Describe and illustrate the accounting for cash dividends and stock dividends.  Accounting for Dividends  Cash Dividends  Stock Dividends	EE 11-3 EE 11-4
Describe and illustrate the accounting for treasury stock transactions.  Treasury Stock Transactions	EE 11-5
Describe and illustrate the reporting of stockholders' equity. Reporting Stockholders' Equity Stockholders' Equity on the Balance Sheet Reporting Retained Earnings Statement of Stockholders' Equity Reporting Stockholders' Equity for Mornin' Joe	EE 11-6 EE 11-7
Describe the effect of stock splits on corporate financial statements.  Stock Splits	
Describe and illustrate the use of earnings per share in evaluating a company's profitability. Financial Analysis and Interpretation: Earnings per Share	EE 11-8
At a Glan	Page 520



# businesses are organized as proprietorships, partnerships, or limited liability companies. Characteristics of a Corporation

**Nature of a Corporation** 

A corporation was defined in the Dartmouth College

case of 1819, in which Chief Justice Marshall of the U.S. Supreme Court stated: "A corporation is an artificial being, invisible, intangible, and existing only in contemplation of the law."

A *corporation* is a legal entity, distinct and separate from the individuals who create and operate it. As a legal entity, a corporation may acquire, own, and dispose of property in its own name. It may also incur liabilities and enter into contracts. Most importantly, it can sell shares of ownership, called **stock**. This characteristic gives corporations the ability to raise large amounts of capital.

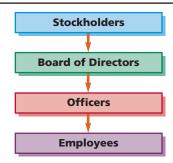
Most large businesses are organized as corporations. As a result, corporations generate

more than 90% of the total business dollars in the United States. In contrast, most small

# The **stockholders** or *shareholders* who own the stock own the corporation. They can buy and sell stock without affecting the corporation's operations or continued existence. Corporations whose shares of stock are traded in public markets are called *public corporations*. Corporations whose shares are not traded publicly are usually owned by a small group of investors and are called *nonpublic* or *private corporations*.

The stockholders of a corporation have *limited liability*. This means that creditors usually may not go beyond the assets of the corporation to satisfy their claims. Thus, the financial loss that a stockholder may suffer is limited to the amount invested.

The stockholders control a corporation by electing a *board of directors*. This board meets periodically to establish corporate policies. It also selects the chief executive officer (CEO) and other major officers to manage the corporation's day-to-day affairs. Exhibit 1 shows the organizational structure of a corporation.



#### EXHIBIT 1

Organizational Structure of a Corporation

As a separate entity, a corporation is subject to taxes. For example, corporations must pay federal income taxes on their income. Thus, corporate income that is distributed to stockholders in the form of *dividends* has already been taxed. In turn, stockholders must pay income taxes on the dividends they receive. This *double taxation* of corporate earnings is a major disadvantage of the corporate form. The advantages and disadvantages of the corporate form are listed in Exhibit 2.

#### Note:

Corporations have a separate legal existence, transferable units of ownership, and limited stockholder liability.

#### **EXHIBIT 2**

#### Advantages and Disadvantages of the Corporate Form

Advantages	Explanation
Separate legal existence	A corporation exists separately from its owners.
Continuous life	A corporation's life is separate from its owners; therefore, it exists indefinitely.
Raising large amounts of capital	The corporate form is suited for raising large amounts of money from shareholders.
Ownership rights are easily transferable	A corporation sells shares of ownership, called <i>stock</i> . The stockholders of a public company can transfer their shares of stock to other stockholders through stock markets, such as the New York Stock Exchange.
Limited liability	A corporation's creditors usually may not go beyond the assets of the corporation to satisfy their claims. Thus, the financial loss that a stockholder may suffer is limited to the amount invested.
Disadvantages	Explanation
Owner is separate from management	Stockholders control management through a board of directors. The board of directors should represent shareholder interests; however, the board is often more closely tied to management than to shareholders. As a result, the board of directors and management may not always behave in the best interests of stockholders.
Double taxation of dividends	As a separate legal entity, a corporation is subject to taxation. Thus, net income distributed as dividends will be taxed once at the corporation level, and then again at the individual level.
Regulatory costs	Corporations must satisfy many requirements, such as those required by the Sarbanes-Oxley Act.

## **Forming a Corporation**

The first step in forming a corporation is to file an *application of incorporation* with the state. State incorporation laws differ, and corporations often organize in those states with the more favorable laws. For this reason, more than half of the largest companies are incorporated in Delaware. Exhibit 3 lists some corporations, their states of incorporation, and the location of their headquarters.

After the application of incorporation has been approved, the state grants a *charter* or *articles of incorporation*. The articles of incorporation formally create the corporation.² The corporate management and board of directors then prepare a set of *bylaws*, which are the rules and procedures for conducting the corporation's affairs.

¹ A majority of states also require corporations to pay income taxes

² The articles of incorporation may also restrict a corporation's activities in certain areas, such as owning certain types of real estate, conducting certain types of business activities, or purchasing its own stock.

#### **EXHIBIT 3**

Examples of Corporations and their States of Incorporation

Corporation	State of Incorporation	Headquarters
Caterpillar	Delaware	Peoria, IL
Delta Air Lines	Delaware	Atlanta, GA
The Dow Chemical Company	Delaware	Midland, MI
Google	Delaware	Mountain View, CA
General Electric Company	New York	Fairfield, CT
The Home Depot	Delaware	Atlanta, GA
Kellogg Company	Delaware	Battle Creek, MI
R.J. Reynolds Tobacco Company	Delaware	Winston-Salem, NC
Starbucks Corporation	Washington	Seattle, WA
Sun Microsystems, Inc.	Delaware	Palo Alto, CA
3M	Delaware	St. Paul, MN
The Washington Post Company	Delaware	Washington, D.C.
Whirlpool Corporation	Delaware	Benton Harbor, MI

Costs may be incurred in organizing a corporation. These costs include legal fees, taxes, state incorporation fees, license fees, and promotional costs. Such costs are debited to an expense account entitled *Organizational Expenses*.

To illustrate, a corporation's organizing costs of \$8,500 on January 5 are recorded as follows:

	Jan. 5	Organizational Expenses  Cash  Paid costs of organizing the corporation.		8,500	8,500	
--	--------	--------------------------------------------------------------------------	--	-------	-------	--



# **Paid-In Capital from Issuing Stock**

The two main sources of stockholders' equity are paid-in capital (or contributed capital) and retained earnings. The main source of paid-in capital is from issuing stock.

#### Characteristics of Stock

The number of shares of stock that a corporation is *authorized* to issue is stated in its charter. The term *issued* refers to the shares issued to the stockholders. A corporation may reacquire some of the stock that it has issued. The stock remaining in the hands of stockholders is then called **outstanding stock**. The relationship between authorized, issued, and outstanding stock is shown in Exhibit 4.

Upon request, corporations may issue stock certificates to stockholders to document their ownership. Printed on a stock certificate is the name of the company, the name of

#### **EXHIBIT 4**

Authorized, Issued, and Outstanding Stock



Number of shares authorized, issued, and outstanding

the stockholder, and the number of shares owned. The stock certificate may also indicate a dollar amount assigned to each share of stock, called **par value**. Stock may be issued without par, in which case it is called *no-par stock*. In some states, the board of directors of a corporation is required to assign a *stated value* to no-par stock.

Corporations have limited liability, and thus, creditors have no claim against stock-holders' personal assets. To protect creditors, however, some states require corporations to maintain a minimum amount of paid-in capital. This minimum amount, called *legal capital*, usually includes the par or stated value of the shares issued.

The major rights that accompany ownership of a share of stock are as follows:

- The right to vote in matters concerning the corporation.
- The right to share in distributions of earnings.
- The right to share in assets upon liquidation.

These stock rights normally vary with the class of stock.

#### **Classes of Stock**

When only one class of stock is issued, it is called **common stock**. Each share of common stock has equal rights.

A corporation may also issue one or more classes of stock with various preference rights such as a preference to dividends. Such a stock is called a **preferred stock**. The dividend rights of preferred stock are stated either as dollars per share or as a percent of par. For example, a \$50 par value preferred stock with a \$4 per share dividend may be described as either:³

preferred \$4 stock, \$50 par or preferred 8% stock, \$50 par

As shown in Exhibit 5, preferred stockholders have first rights (preference) to any dividends, and thus, they have a greater chance of receiving dividends than common stockholders. However, since dividends are normally based on earnings, a corporation cannot guarantee dividends even to preferred stockholders.



#### Note:

The two primary classes of paid-in capital are common stock and preferred stock.



EXHIBIT 5

**Dividend Preferences** 

The payment of dividends is authorized by the corporation's board of directors. When authorized, the directors are said to have *declared* a dividend.

**Cumulative preferred stock** has a right to receive regular dividends that were not declared (paid) in prior years. Noncumulative preferred stock does not have this right.

Cumulative preferred stock dividends that have not been paid in prior years are said to be **in arrears**. Any preferred dividends in arrears must be paid before any common stock dividends are paid. In addition, any dividends in arrears are normally disclosed in notes to the financial statements.

To illustrate, assume that a corporation has issued the following preferred and common stock:

1,000 shares of cumulative preferred \$4 stock, \$50 par 4,000 shares of common stock, \$15 par

³ In some cases, preferred stock may receive additional dividends if certain conditions are met. Such stock, called *participating preferred stock*, is not often issued.

The corporation was organized on January 1, 2014, and paid no dividends in 2014 and 2015. In 2016, the corporation paid \$22,000 in dividends, of which \$12,000 was paid to preferred stockholders and \$10,000 was paid to common stockholders, computed as follows:

Total dividends paid		\$22,000
Preferred stockholders:		
2014 dividends in arrears (1,000 shares × \$4)	\$4,000	
2015 dividends in arrears (1,000 shares × \$4)	4,000	
2016 dividend (1,000 shares × \$4)	4,000	
Total preferred dividends paid		(12,000)
Dividends available to common stockholders		\$10,000

As a result, preferred stockholders received \$12.00 per share ( $$12,000 \div 1,000$  shares) in dividends, while common stockholders received \$2.50 per share ( $$10,000 \div 4,000$  shares).

In addition to dividend preference, preferred stock may be given preferences to assets if the corporation goes out of business and is liquidated. However, claims of creditors must be satisfied first. Preferred stockholders are next in line to receive any remaining assets, followed by the common stockholders.

### Example Exercise 11-1 Dividends per Share



Sandpiper Company has 20,000 shares of cumulative preferred 1% stock of \$100 par and 100,000 shares of \$50 par common stock. The following amounts were distributed as dividends:

Year 1 \$10,000 Year 2 45,000 Year 3 80,000

Determine the dividends per share for preferred and common stock for each year.

#### Follow My Example 11-1

Year 1	Year 2	Year 3
\$10,000	\$45,000	\$80,000
10,000	30,000*	20,000
\$ 0	\$15,000	\$60,000
\$0.50	\$1.50	\$1.00
None	\$0.15	\$0.60
	\$10,000 10,000 \$ 0 \$0.50	\$10,000 \$45,000 10,000 30,000* \$ 0 \$15,000 \$0.50 \$1.50

Practice Exercises: PE 11-1A, PE 11-1B

# **Issuing Stock**



A separate account is used for recording the amount of each class of stock issued to investors in a corporation. For example, assume that a corporation is authorized to issue 10,000 shares of \$100 par preferred stock and 100,000 shares of \$20 par common stock. The corporation issued 5,000 shares of preferred stock and 50,000

shares of common stock at par for cash. The corporation's entry to record the stock issue is as follows:⁴

Cash Preferred Stock Common Stock Issued preferred stock and common stock at par for cash.		1,500,000	500,000 1,000,000	
--------------------------------------------------------------------------------------------	--	-----------	----------------------	--

Stock is often issued by a corporation at a price other than its par. The price at which stock is sold depends on a variety of factors, such as the following:

- The financial condition, earnings record, and dividend record of the corporation.
- Investor expectations of the corporation's potential earning power.
- General business and economic conditions and expectations.

If stock is issued (sold) for a price that is more than its par, the stock has been sold at a **premium**. For example, if common stock with a par of \$50 is sold for \$60 per share, the stock has sold at a premium of \$10.

If stock is issued (sold) for a price that is less than its par, the stock has been sold at a **discount**. For example, if common stock with a par of \$50 is sold for \$45 per share, the stock has sold at a discount of \$5. Many states do not permit stock to be sold at a discount. In other states, stock may be sold at a discount in only unusual cases. Because stock is rarely sold at a discount, it is not illustrated.

In order to distribute dividends, financial statements, and other reports, a corporation must keep track of its stockholders. Large public corporations normally use a financial institution, such as a bank, for this purpose.⁵ In such cases, the financial institution is referred to as a *transfer agent* or *registrar*.

#### **Premium on Stock**

When stock is issued at a premium, Cash is debited for the amount received. Common Stock or Preferred Stock is credited for the par amount. The excess of the amount paid over par is part of the paid-in capital. An account entitled *Paid-In Capital in Excess of Par* is credited for this amount.

To illustrate, assume that Caldwell Company issues 2,000 shares of \$50 par preferred stock for cash at \$55. The entry to record this transaction is as follows:

		Cash Preferred Stock Paid-In Capital in Excess of Par—Preferred Stock Issued \$50 par preferred stock at \$55.		110,000	100,000		
--	--	----------------------------------------------------------------------------------------------------------------	--	---------	---------	--	--

When stock is issued in exchange for assets other than cash, such as land, buildings, and equipment, the assets acquired are recorded at their fair market value. If this value cannot be determined, the fair market price of the stock issued is used.

To illustrate, assume that a corporation acquired land with a fair market value that cannot be determined. In exchange, the corporation issued 10,000 shares of its

⁴The accounting for investments in stocks from the point of view of the investor is discussed in Chapter 13.

⁵ Small corporations may use a subsidiary ledger, called a *stockholders ledger*. in this case, the stock accounts (Preferred Stock and Common Stock) are controlling accounts for the subsidiary ledger.

\$10 par common stock. If the stock has a market price of \$12 per share, the transaction is recorded as follows:

Land Common Stock Paid-In Capital in Excess of Par Issued \$10 par common stock, valued at \$12 per share, for land.	120,000	100,000 20,000	
at \$12 per share, for land.			

#### **No-Par Stock**

In most states, no-par preferred and common stock may be issued. When no-par stock is issued, Cash is debited and Common Stock is credited for the proceeds. As no-par stock is issued over time, this entry is the same even if the issuing price varies.

To illustrate, assume that on January 9, a corporation issues 10,000 shares of nopar common stock at \$40 a share. On June 27, the corporation issues an additional 1,000 shares at \$36. The entries to record these issuances of the no-par stock are as follows:

Jan.	9	Cash Common Stock Issued 10,000 shares of no-par common stock at \$40.	400,000	400,000	
June	27	Cash Common Stock Issued 1,000 shares of no-par common stock at \$36.	36,000	36,000	

In some states, no-par stock may be assigned a *stated value per share*. The stated value is recorded like a par value. Any excess of the proceeds over the stated value is credited to *Paid-In Capital in Excess of Stated Value*.

To illustrate, assume that in the preceding example the no-par common stock is assigned a stated value of \$25. The issuance of the stock on January 9 and June 27 is recorded as follows:

Jan.	9	Cash Common Stock Paid-In Capital in Excess of Stated Value Issued 10,000 shares of no-par common stock at \$40; stated value, \$25.	400,000	250,000 150,000	
June	27	Cash Common Stock Paid-In Capital in Excess of Stated Value Issued 1,000 shares of no-par common stock at \$36; stated value, \$25.	36,000	25,000 11,000	



# Business Connection

#### **GOOGLE INC.**

Some excepts from Google's bylaws follow:

#### **ARTICLE I—CORPORATE OFFICES**

#### 1.1 REGISTERED OFFICE.

The registered office of Google Inc. shall be fixed in the corporation's certificate of incorporation. ...

#### 1.2 OTHER OFFICES.

The corporation's Board of Directors (the "Board") may at any time establish other offices at any place or places where the corporation is qualified to do business.

#### **ARTICLE II—MEETINGS OF STOCKHOLDERS**

#### 2.2 ANNUAL MEETING.

The annual meeting of stockholders shall be held each year on a date and at a time designated by the Board. At the annual meeting, directors shall be elected and any other proper business may be transacted.

#### 2.4 NOTICE OF STOCKHOLDERS' MEETINGS.

All notices of meetings of stockholders shall be sent ... not less than ten (10) nor more than sixty (60) days before the date of the meeting to each stockholder entitled to vote at such meeting. ... The notice shall specify the place, if any, date and hour of the meeting, the means of remote communication, if any, by which stockholders and proxy holders may be deemed to be present in person and vote at such meeting. ...

#### 2.8 ADMINISTRATION OF THE MEETING.

Meetings of stockholders shall be presided over by the chairman of the Board. ...

#### **ARTICLE V—OFFICERS**

#### 5.1 OFFICERS.

The officers of the corporation shall be a chief executive officer, one or more presidents (at the discretion of the Board), a chairman of the Board and a secretary. The corporation may also have, at the discretion of the Board, a vice chairman of the Board, a chief financial officer, a treasurer, one or more vice presidents, one or more assistant vice presidents, one or more assistant treasurers, one or more assistant secretaries, and any such other officers as may be appointed in accordance with the provisions of these bylaws.

#### 5.6 CHAIRMAN OF THE BOARD.

The chairman of the Board shall be a member of the Board and, if present, preside at meetings of the Board. ...

#### 5.7 CHIEF EXECUTIVE OFFICER.

Subject to the control of the Board, ... the chief executive officer shall, together with the president or presidents of the corporation, have general supervision, direction, and control of the business and affairs of the corporation. ... The chief executive officer shall ... preside at all meetings of the stockholders.

#### 5.11 CHIEF FINANCIAL OFFICER.

The chief financial officer shall keep and maintain ... adequate and correct books and records of accounts of the properties and business transactions of the corporation, including accounts of its assets, liabilities, receipts, disbursements, gains, losses, capital, retained earnings and shares. . . .

#### 5.12 TREASURER.

The treasurer shall deposit all moneys and other valuables in the name and to the credit of the corporation. ...

Source: http://investor.google.com/corporate/bylaws.html

# Example Exercise 11-2 Entries for Issuing Stock



On March 6, Limerick Corporation issued for cash 15,000 shares of no-par common stock at \$30. On April 13, Limerick issued at par 1,000 shares of preferred 4% stock, \$40 par for cash. On May 19, Limerick issued for cash 15,000 shares of 4%, \$40 par preferred stock at \$42.

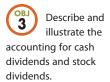
Journalize the entries to record the March 6, April 13, and May 19 transactions.

### Follow My Example 11-2

Mar. 6	Cash	450,000	
	Common Stock		450,000
	(15,000 shares $\times$ \$30).		
Apr. 13	Cash	40,000	
	Preferred Stock		40,000
	$(1,000 \text{ shares} \times $40).$		
May 19	Cash	630,000	
	Preferred Stock		600,000
	Paid-In Capital in Excess of Par		30,000
	$(15,000 \text{ shares} \times $42).$		

Practice Exercises: PE 11-2A, PE 11-2B

.....



# **Accounting for Dividends**

When a board of directors declares a cash dividend, it authorizes the distribution of cash to stockholders. When a board of directors declares a stock dividend, it authorizes the distribution of its stock. In both cases, declaring a dividend reduces the retained earnings of the corporation.⁶

## **Cash Dividends**

A cash distribution of earnings by a corporation to its shareholders is a cash dividend. Although dividends may be paid in other assets, cash dividends are the most common. Three conditions for a cash dividend are as follows:

- · Sufficient retained earnings
- Sufficient cash
- · Formal action by the board of directors

# International 🎇 Connection





# IFRS FOR SMEs

In 2010, the International Accounting Standards Board (IASB) issued a set of accounting standards specifically designed for small- and medium-sized enterprises (SMEs) called International Financial Reporting Standards (IFRS) for SMEs. SMEs in the United States are private companies and such small corporations that they do not report to the Securities and Exchange Commission (SEC). IFRS for SMEs consist of only 230 pages, compared to 2,700

pages for full IFRS. These standards are designed to be cost effective for SMEs. Thus, IFRS for SMEs require fewer disclosures and contain no industry-specific standards or exceptions.

The American Institute of CPAs (AICPA) has accepted IFRS for SMEs as part of U.S. generally accepted accounting principles (GAAP) for private companies not reporting to the SEC. If users, such as bankers and investors, accept these financial statements, IFRS for SMEs may become popular in the United States.*

*Differences between U.S. GAAP and IFRS are further discussed and illustrated in Appendix C.

There must be a sufficient (large enough) balance in Retained Earnings to declare a cash dividend. That is, the balance of Retained Earnings must be large enough so that the dividend does not create a debit balance in the retained earnings account. However, a large Retained Earnings balance does not mean that there is cash available to pay dividends. This is because the balances of Cash and Retained Earnings are often unrelated.

Even if there are sufficient retained earnings and cash, a corporation's board of directors is not required to pay dividends. Nevertheless, many corporations pay quarterly cash dividends to make their stock more attractive to investors. Special or extra dividends may also be paid when a corporation experiences higher than normal profits.

Three dates included in a dividend announcement are as follows:

- 1. Date of declaration
- 2. Date of record
- 3. Date of payment

The date of declaration is the date the board of directors formally authorizes the payment of the dividend. On this date, the corporation incurs the liability to pay the amount of the dividend.

The date of record is the date the corporation uses to determine which stockholders will receive the dividend. During the period of time between the date of declaration and

Microsoft Corporation declared a

dividend of \$0.28 per share on November 19, 2013, to common stockholders of record as of February 20, 2014, payable on March 13, 2014.

⁶ In rare cases, when a corporation is reducing its operations or going out of business, a dividend may be a distribution of paid-in capital. Such a dividend is called a liquidating dividend.

the date of record, the stock price is quoted as selling with-dividends. This means that any investors purchasing the stock before the date of record will receive the dividend.

The date of payment is the date the corporation will pay the dividend to the stockholders who owned the stock on the date of record. During the period of time between the record date and the payment date, the stock price is quoted as selling ex-dividends. This means that since the date of record has passed, any new investors will not receive the dividend.

To illustrate, assume that on October 1, Hiber Corporation declares the following cash dividends with a date of record of November 10 and a date of payment of December 2:

	Dividend	Total	
	per Share	Dividends	
Preferred stock, \$100 par, 5,000 shares outstanding	\$2.50	\$12,500	
Common stock, \$10 par, 100,000 shares outstanding	\$0.30	30,000	
Total		\$42,500	

On October 1, the declaration date, Hiber Corporation records the following entry:

	Oct.	1	Cash Dividends Cash Dividends Payable Declared cash dividends.		42,500	42,500	
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**Declaration Date** 

On November 10, the date of record, no entry is necessary. This date merely **Date of Record** determines which stockholders will receive the dividends.

On December 2, the date of payment, Hiber Corporation records the payment of the dividends as follows:

|--|

Date of Payment

At the end of the accounting period, the balance in Cash Dividends will be transferred to Retained Earnings as part of the closing process. This closing entry debits Retained Earnings and credits Cash Dividends for the balance of the cash dividends account. If the cash dividends have not been paid by the end of the period, Cash Dividends Payable will be reported on the balance sheet as a current liability.

# Example Exercise 11-3 Entries for Cash Dividends

The important dates in connection with a cash dividend of \$75,000 on a corporation's common stock are February 26, March 30, and April 2. Journalize the entries required on each date.

# Follow My Example 11-3

Feb. 26	Cash Dividends	75,000	
	Cash Dividends Payable		75,000
Mar. 30	No entry required.		
Apr. 2	Cash Dividends Payable	75,000	
	Cash		75,000

Practice Exercises: PE 11-3A, PE 11-3B

# Integrity, Objectivity, and Ethics in Business



#### THE PROFESSOR WHO KNEW TOO MUCH

A major Midwestern university released a quarterly "American Customer Satisfaction Index" based on its research of customers of popular U.S. products and services. Before the release of the index to the public, the professor in charge of the research bought and sold stocks of some of the companies in the report. The professor was quoted as saying that he thought it was important to test his theories of customer satisfaction with "real" [his own] money.

Is this proper or ethical? Apparently, the dean of the Business School didn't think so. In a statement to

the press, the dean stated: "I have instructed anyone affiliated with the (index) not to make personal use of information gathered in the course of producing the quarterly index, prior to the index's release to the general public, and they [the researchers] have agreed."

Sources: Jon E. Hilsenrath and Dan Morse, "Researcher Uses Index to Buy, Short Stocks," *The Wall Street Journal*, February 18, 2003; and Jon E. Hilsenrath, "Satisfaction Theory: Mixed Results," *The Wall Street Journal*, February 19, 2003.

### **Stock Dividends**

A **stock dividend** is a distribution of shares of stock to stockholders. Stock dividends are normally declared only on common stock and issued to common stockholders.

A stock dividend affects only stockholders' equity. Specifically, the amount of the stock dividend is transferred from Retained Earnings to Paid-In Capital. The amount transferred is normally the fair value (market price) of the shares issued in the stock dividend.⁷

To illustrate, assume that the stockholders' equity accounts of Hendrix Corporation as of December 15 are as follows:

Common Stock, \$20 par (2,000,000 shares issued)	\$40,000,000
Paid-In Capital in Excess of Par—Common Stock	9,000,000
Retained Farnings	26.600.000

On December 15, Hendrix Corporation declares a stock dividend of 5% or 100,000 shares  $(2,000,000 \text{ shares} \times 5\%)$  to be issued on January 10 to stockholders of record on December 31. The market price of the stock on December 15 (the date of declaration) is \$31 per share.

The entry to record the stock dividend is as follows:

Dec.
------

After the preceding entry is recorded, Stock Dividends will have a debit balance of \$3,100,000. Like cash dividends, the stock dividends account is closed to Retained Earnings at the end of the accounting period. This closing entry debits Retained Earnings and credits Stock Dividends.

At the end of the period, the *stock dividends distributable* and *paid-in capital in excess of par—common stock* accounts are reported in the Paid-In Capital section of the balance sheet. Thus, the effect of the preceding stock dividend is to transfer \$3,100,000 of retained earnings to paid-in capital.

⁷ The use of fair market value is justified as long as the number of shares issued for the stock dividend is small (less than 25% of the shares outstanding).

On January 10, the stock dividend is distributed to stockholders by issuing 100,000 shares of common stock. The issuance of the stock is recorded by the following entry:

	Jan.	10	Stock Dividends Distributable Common Stock Issued stock as stock dividend.		2,000,000	2,000,000	
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A stock dividend does not change the assets, liabilities, or total stockholders' equity of a corporation. Likewise, a stock dividend does not change an individual stockholder's proportionate interest (equity) in the corporation.

To illustrate, assume a stockholder owns 1,000 of a corporation's 10,000 shares outstanding. If the corporation declares a 6% stock dividend, the stockholder's proportionate interest will not change, computed as follows:

	Before	After
	Stock Dividend	Stock Dividend
Total shares issued	10,000	10,600 [10,000 + (10,000 × 6%)]
Number of shares owned	1,000	$1,060 [1,000 + (1,000 \times 6\%)]$
Proportionate ownership	10% (1,000 ÷ 10,000)	10% (1,060 ÷ 10,600)

## Example Exercise 11-4 Entries for Stock Dividends



Vienna Highlights Corporation has 150,000 shares of \$100 par common stock outstanding. On June 14, Vienna Highlights declared a 4% stock dividend to be issued August 15 to stockholders of record on July 1. The market price of the stock was \$110 per share on June 14.

Journalize the entries required on June 14, July 1, and August 15.

Follow My Example 11-4						
June 14	Stock Dividends (150,000 $\times$ 4% $\times$ \$110)	660,000				
	Stock Dividends Distributable (6,000 × \$100)	600,000				
	Paid-In Capital in Excess of Par—Common Stock					
	(\$660,000 – \$600,000)	60,000				
July 1	No entry required.					
Aug. 15	Stock Dividends Distributable	600,000				
	Common Stock	600,000				
	Prac	rtica Evercises: PF 11-4A PF 11-4R				

# **Treasury Stock Transactions**

**Treasury stock** is stock that a corporation has issued and then reacquired. A corporation may reacquire (purchase) its own stock for a variety of reasons, including the following:

- To provide shares for resale to employees
- To reissue as bonuses to employees, or
- To support the market price of the stock

The *cost method* is normally used for recording the purchase and resale of treasury stock.⁸ Using the cost method, *Treasury Stock* is debited for the cost (purchase price) of the stock. When the stock is resold, Treasury Stock is credited for its cost. Any difference between the cost and the selling price is debited or credited to *Paid-In Capital from Sale of Treasury Stock*.

Describe and illustrate the accounting for treasury stock transactions.



The 2012 edition of Accounting
Trends & Techniques

indicated that 68.2% of the companies surveyed reported treasury stock.



⁸ Another method that is infrequently used, called the *par value method*, is discussed in advanced accounting texts.

To illustrate, assume that a corporation has the following paid-in capital on January 1:

Common stock, \$25 par (20,000 shares authorized and issued) \$500,000 Excess of issue price over par \$\frac{150,000}{\$650,000}\$

On February 13, the corporation purchases 1,000 shares of its common stock at \$45 per share. The entry to record the purchase of the treasury stock is as follows:

Feb. 13	Treasury Stock Cash Purchased 1,000 shares of treasury stock at \$45.		45,000	45,000	
---------	-----------------------------------------------------------------------	--	--------	--------	--

On April 29, the corporation sells 600 shares of the treasury stock for \$60. The entry to record the sale is as follows:

Apr.	29	Cash	36,000		
		Treasury Stock		27,000	
		Paid-In Capital from Sale of Treasury Stock Sold 600 shares of treasury stock at \$60.		9,000	

A sale of treasury stock may result in a decrease in paid-in capital. To the extent that Paid-In Capital from Sale of Treasury Stock has a credit balance, it is debited for any such decrease. Any remaining decrease is then debited to the retained earnings account.

To illustrate, assume that on October 4, the corporation sells the remaining 400 shares of treasury stock for \$40 per share. The entry to record the sale is as follows:

	Oct.	4	Cash Paid-In Capital from Sale of Treasury Stock Treasury Stock Sold 400 shares of treasury stock at \$40.		16,000 2,000	18,000	
--	------	---	---------------------------------------------------------------------------------------------------------------------	--	-----------------	--------	--

The preceding October 4 entry decreases paid-in capital by \$2,000. Because Paid-In Capital from Sale of Treasury Stock has a credit balance of \$9,000, the entire \$2,000 was debited to Paid-In Capital from Sale of Treasury Stock.

No dividends (cash or stock) are paid on the shares of treasury stock. To do so would result in the corporation earning dividend revenue from itself.

# Example Exercise 11-5 Entries for Treasury Stock



On May 3, Buzz Off Corporation reacquired 3,200 shares of its common stock at \$42 per share. On July 22, Buzz Off sold 2,000 of the reacquired shares at \$47 per share. On August 30, Buzz Off sold the remaining shares at \$40 per share. Journalize the transactions of May 3, July 22, and August 30.

## Follow My Example 11-5

May 3	Treasury Stock (3,200 × \$42)	134,400	134,400
July 22	Cash (2,000 × \$47)	94,000	
	Treasury Stock (2,000 × \$42)		84,000
	Paid-In Capital from Sale of Treasury Stock [2,000 × (\$47 – \$42)]		10,000
Aug. 30	Cash (1,200 × \$40)	48,000	
	Paid-In Capital from Sale of Treasury Stock [1,200 × (\$42 – \$40)]	2,400	
	Treasury Stock (1,200 × \$42)		50,400

Practice Exercises: PE 11-5A, PE 11-5B

# **Reporting Stockholders' Equity**

As with other sections of the balance sheet, alternative terms and formats may be used in reporting stockholders' equity. Also, changes in retained earnings and paid-in capital may be reported in separate statements or notes to the financial statements.



## Stockholders' Equity on the Balance Sheet

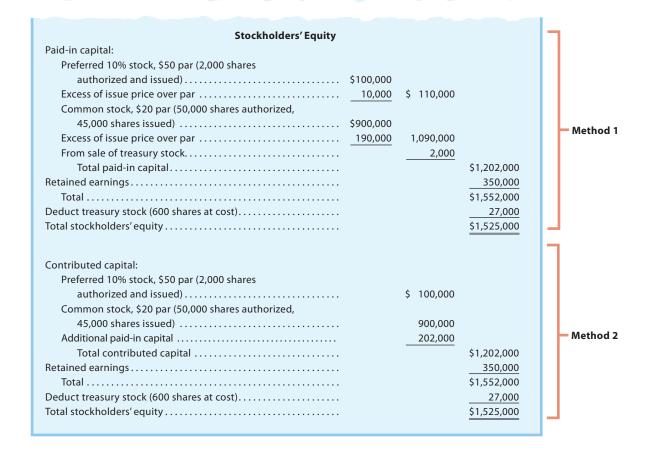
Exhibit 6 shows two methods for reporting stockholders' equity for the December 31, 2016, balance sheet for Telex Inc.

- Method 1. Each class of stock is reported, followed by its related paid-in capital accounts. Retained earnings is then reported followed by a deduction for treasury stock.
- Method 2. The stock accounts are reported, followed by the paid-in capital reported as
  a single item, Additional paid-in capital. Retained earnings is then reported
  followed by a deduction for treasury stock.

### Stockholders' Equity Section of a Balance Sheet

**EXHIBIT 6** 

Telex Inc.
Balance Sheet
December 31, 2016



Significant changes in stockholders' equity during a period may also be presented in a statement of stockholders' equity or in the notes to the financial statements. The statement of stockholders' equity is illustrated later in this section. Relevant rights and privileges of the various classes of stock outstanding should also be reported. Examples include dividend and liquidation preferences, conversion rights, and redemption rights. Such information may be disclosed on the face of the balance sheet or in the notes to the financial statements.

## Example Exercise 11-6 Reporting Stockholders' Equity



Practice Exercises: PE 11-6A, PE 11-6B

Using the following accounts and balances, prepare the Stockholders' Equity section of the balance sheet. Forty thousand shares of common stock are authorized, and 5,000 shares have been reacquired.

Common Stock, \$50 par	\$1,500,000
Paid-In Capital from Sale of Treasury Stock	44,000
Paid-In Capital in Excess of Par	160,000
Retained Earnings	4,395,000
Treasury Stock	120,000

### Follow My Example 11-6

Stockholders' Equity		
Paid-in capital:		
Common stock, \$50 par		
(40,000 shares authorized, 30,000 shares issued)	\$1,500,000	
Excess of issue price over par	160,000	\$1,660,000
From sale of treasury stock		44,000
Total paid-in capital		\$1,704,000
Retained earnings		4,395,000
Total		\$6,099,000
Deduct treasury stock (5,000 shares at cost)		120,000
Total stockholders' equity		\$5,979,000

# **Reporting Retained Earnings**

Changes in retained earnings may be reported using one of the following:

- Separate retained earnings statement
- Combined income and retained earnings statement
- Statement of stockholders' equity

Changes in retained earnings may be reported in a separate retained earnings statement. When a separate **retained earnings statement** is prepared, the beginning balance of retained earnings is reported. The net income is then added (or net loss is subtracted) and any dividends are subtracted to arrive at the ending retained earnings for the period.

To illustrate, a retained earnings statement for Telex Inc. is shown in Exhibit 7.

### EXHIBIT 7

#### Retained Earnings Statement

Telex Inc. Retained Earnings Statem For the Year Ended December 1			
Retained earnings, January 1, 2016		\$180,000	\$245,000
Preferred stock dividends	\$10,000 <u>65,000</u>	75,000	_105,000 \$350,000

⁹ FASB Accounting Standards Codification, Section 505-10-50.

Changes in retained earnings may also be reported in combination with the income statement. This format emphasizes net income as the connecting link between the income statement and ending retained earnings. Because this format is not often used, we do not illustrate it.

Changes in retained earnings may also be reported in a statement of stockholders' equity. An example of reporting changes in retained earnings in a statement of stockholders' equity for Telex Inc. is shown in Exhibit 8.

## **Example Exercise 11-7** Retained Earnings Statement

Dry Creek Cameras Inc. reported the following results for the year ending March 31, 2016:

Retained earnings, April 1, 2015 \$3,338,500

Net income 461,500

Cash dividends declared 80,000

Stock dividends declared 120,000

Prepare a retained earnings statement for the fiscal year ended March 31, 2016.

### Follow My Example 11-7

#### **Dry Creek Cameras Inc.**

Retained Earnings Statement For the Year Ended March 31, 2016

 Retained earnings, April 1, 2015
 \$3,338,500

 Net income
 \$461,500

 Less dividends declared
 200,000

Increase in retained earnings261,500Retained earnings, March 31, 2016\$3,600,000

Practice Exercises: PE 11-7A, PE 11-7B

**Restrictions** The use of retained earnings for payment of dividends may be restricted by action of a corporation's board of directors. Such **restrictions**, sometimes called *appropriations*, remain part of the retained earnings.

Restrictions of retained earnings are classified as:

Legal. State laws may require a restriction of retained earnings.

Example: States may restrict retained earnings by the amount of treasury stock purchased. In this way, legal capital cannot be used for dividends.

 Contractual. A corporation may enter into contracts that require restrictions of retained earnings.

Example: A bank loan may restrict retained earnings so that money for repaying the loan cannot be used for dividends.

 Discretionary. A corporation's board of directors may restrict retained earnings voluntarily.

Example: The board may restrict retained earnings and, thus, limit dividend distributions so that more money is available for expanding the business.

Restrictions of retained earnings must be disclosed in the financial statements. Such disclosures are usually included in the notes to the financial statements.

**Prior Period Adjustments** An error may arise from a mathematical mistake or from a mistake in applying accounting principles. Such errors may not be discovered within the same period in which they occur. In such cases, the effect of the error should not affect the current period's net income. Instead, the correction of the error, called a **prior period adjustment**, is reported in the retained earnings statement. Such corrections are reported as an adjustment to the beginning balance of retained earnings.¹⁰

¹⁰ Prior period adjustments are illustrated in advanced texts.

# **Statement of Stockholders' Equity**

When the only change in stockholders' equity is due to net income or net loss and dividends, a retained earnings statement is sufficient. However, when a corporation also has changes in stock and paid-in capital accounts, a **statement of stockholders' equity** is normally prepared.

A statement of stockholders' equity is normally prepared in a columnar format. Each column is a major stockholders' equity classification. Changes in each classification are then described in the left-hand column. Exhibit 8 illustrates a statement of stockholders' equity for Telex Inc.

### **EXHIBIT 8**

#### Statement of Stockholders' Equity

Telex Inc. Statement of Stockholders' Equity For the Year Ended December 31, 2016							
	Preferred Stock	Common Stock	Additional Paid-In Capital	Retained Earnings	Treasury Stock	Total	
Balance, January 1, 2016	\$100,000	\$850,000	\$177,000	\$245,000 180,000 (10,000) (65,000)	\$(17,000)	\$1,355,000 180,000 (10,000) (65,000)	
Issuance of additional common stock Purchase of treasury stock	\$100,000	50,000 \$900,000	25,000 \$202,000	\$350,000	(10,000) \$(27,000)	75,000 (10,000) \$1,525,000	



# Reporting Stockholders' Equity for Mornin' Joe

**Mornin' Joe** reports stockholders' equity in its balance sheet. Mornin' Joe also includes a retained earnings statement and statement of stockholders' equity in its financial statements.

The Stockholders' Equity section of Mornin' Joe's balance sheet as of December 31, 2016, follows:

#### Mornin' Joe Balance Sheet December 31, 2016

Stockholders' Equity		
Paid-in capital: Preferred 10% stock, \$50 par (6,000 shares authorized and issued)	\$ 300,000 	\$ 350,000
Common stock, \$20 par (50,000 shares authorized, 45,000 shares issued)  Excess of issue price over par  Total paid-in capital  Retained earnings  Total  Deduct treasury stock (1,000 shares at cost)  Total stockholders' equity  Total liabilities and stockholders' equity	\$ 900,000 	2,350,000 \$2,700,000 1,200,300 \$3,900,300 46,000 \$3,854,300 \$6,169,700

Mornin' Joe's retained earnings statement for the year ended December 31, 2016, is as follows:

Mornin' Jo Retained Earning: For the Year Ended Dec	s Statment	016	
Retained earnings, January 1, 2016	\$30,000	\$421,600	\$ 852,700
Common stock	44,000		347,600 \$1,200,300

The statement of stockholders' equity for Mornin' Joe follows:

Mornin' Joe Statement of Stockholders' Equity For the Year Ended December 31, 2016							
	Preferred Stock	Common Stock	Additional Paid-In Capital	Retained Earnings	Treasury Stock	Total	
Balance, January 1, 2016	\$300,000	\$800,000	\$1,325,000	\$ 852,700 421,600 (30,000) (44,000)	\$(36,000)	\$3,241,700 421,600 (30,000) (44,000)	
common stock	\$300,000	\$900,000	175,000 \$1,500,000	\$1,200,300	(10,000) \$(46,000)	275,000 (10,000) \$3,854,300	

# **Stock Splits**

A **stock split** is a process by which a corporation reduces the par or stated value of its common stock and issues a proportionate number of additional shares. A stock split applies to all common shares including the unissued, issued, and treasury shares.

A major objective of a stock split is to reduce the market price per share of the stock. This attracts more investors and broadens the types and numbers of stockholders.

To illustrate, assume that Rojek Corporation has 10,000 shares of \$100 par common stock outstanding with a current market price of \$150 per share. The board of directors declares the following stock split:

- 1. Each common shareholder will receive 5 shares for each share held. This is called a 5-for-l stock split. As a result, 50,000 shares (10,000 shares × 5) will be outstanding.
- 2. The par of each share of common stock will be reduced to \$20 ( $$100 \div 5$ ).

The par value of the common stock outstanding is \$1,000,000 both before and after the stock split as shown in Exhibit 9 and computed as follows:

	Before Split	After Split
Number of shares	10,000	50,000
Par value per share	×\$100	×\$20
Total	\$1,000,000	\$1,000,000

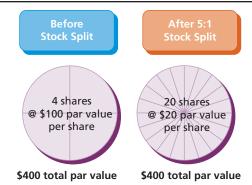
In addition, each Rojek Corporation shareholder owns the same total par amount of stock before and after the stock split. For example, a stockholder who owned 4 shares of \$100 par stock before the split (total par of \$400) would own 20 shares of





#### **EXHIBIT 9**

**Stock Split: Before** and After



\$20 par stock after the split (total par of \$400). Only the number of shares and the par value per share have changed.

Because there are more shares outstanding after the stock split, the market price of the stock should decrease. For example, in the preceding example, there would be 5 times as many shares outstanding after the split. Thus, the market price of the stock would be expected to fall from \$150 to about \$30 ( $$150 \div 5$ ).

Stock splits do not require a journal entry because only the par (or stated) value and number of shares outstanding have changed. However, the details of stock splits are normally disclosed in the notes to the financial statements.

#### Note:

A stock split does not require a journal entry.



# Business 🔀 Connection

#### **BUFFETT ON STOCK SPLITS**

Warren E. Buffett, chairman and chief executive officer of Berkshire Hathaway Inc., opposes stock splits on the basis that they add no value to the company. Since its inception, Berkshire Hathaway has never declared a stock split on its primary (Class A) common stock. As a result, Berkshire Hathaway's Class A common stock sells well above \$170,000 per share, which is the most expensive stock on the New York Stock Exchange. Such a high price doesn't bother Buffet because he believes that high stock prices attract more sophisticated and long-term investors and discourage stock speculators and short-term investors.

In contrast, Microsoft Corporation has split its stock nine times since it went public in 1986. As a result, one share of Microsoft purchased in 1986 is equivalent to 288 shares today, which would be worth more than \$10,000.

### Describe and illustrate the use of earnings per share in evaluating a company's profitability.



# **Financial Analysis and Interpretation: Earnings per Share**

Net income is often used by investors and creditors in evaluating a company's profitability. However, net income by itself is difficult to use in comparing companies of different sizes. Also, trends in net income may be difficult to evaluate if there have been significant changes in a company's stockholders' equity. Thus, the profitability of companies is often expressed as earnings per share.

Earnings per common share (EPS), sometimes called basic earnings per share, is the net income per share of common stock outstanding during a period.¹¹ Corporations whose stock is traded in a public market must report earnings per common share on their income statements.

Earnings per share is computed as follows:

Net Income - Preferred Dividends Earnings per Share = Average Number of Common Shares Outstanding

If a company has preferred stock outstanding, any preferred dividends are subtracted from net income. This is because the numerator represents only those earnings available to the common shareholders.

¹¹ For complex capital structures, earnings per share assuming dilution may also be reported as described in Chapter 15.

To illustrate, the following data (in thousands) were taken from recent financial statements of Google:

	Year 2	Year 1
Net income	\$10,737,000	\$9,737,000
Average number of common shares		
outstanding	327,213 shares	322,778 shares
Earnings per share	\$32.81	\$30.17
	(\$10,737,000 ÷ 327,213 shares)	(\$9,737,000 ÷ 322,778 shares)

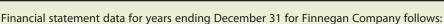
Google had no preferred stock outstanding; thus, no preferred dividends were subtracted in computing earnings per share. As illustrated, Google's earnings per share increased from \$30.17 in Year 1 to \$32.81 in Year 2. An increase in earnings per share is generally considered a favorable trend.

Earnings per share can be used to compare two companies with different net incomes. For example, the following data (in millions) were taken from a recent year's financial statements for Goldman Sachs Group, Inc., and Wells Fargo & Company:

		Goldman Sachs	Wells Fargo
Net income		\$7,475	\$18,897
	dends ber of common	\$183	\$898
shares outs	tanding	516.1 shares	5,287.6 shares
Goldman Sachs:			
Farmings nor Chara	Net Income – Preferred Dividends	<u> </u>	\$7,292 = \$14.13
Earnings per Share =	Average Number of Common Shares Outstanding	516.1 shares	
Wells Fargo:			
Earnings per Share =	Net Income – Preferred Dividend	s = \$18,897 - \$898	= \$17,999 = \$3.4
Larrings per strate –	Average Number of Common Shares Outstanding	5,287.6 shares	4

Based on earnings per share, Goldman Sachs is more profitable than Wells Fargo.

# Example Exercise 11-8 Earnings per Share



	2016	2015
Net income	\$350,000	\$195,000
Preferred dividends	\$20,000	\$15,000
Average number of common shares outstanding	75 000 shares	50 000 shares

- a. Determine earnings per share for 2016 and 2015.
- b. Does the change in the earnings per share from 2015 to 2016 indicate a favorable or an unfavorable trend?

# Follow My Example 11-8

a.

2016: Earnings per Share = 
$$\frac{\text{Net Income - Preferred Dividends}}{\text{Average Number of Common Shares Outstanding}} = \frac{\$350,000 - \$20,000}{75,000 \text{ shares}} = \frac{\$330,000}{75,000 \text{ shares}} = \$4.40$$
2015: Earnings per Share = 
$$\frac{\text{Net Income - Preferred Dividends}}{\text{Average Number of Common Shares Outstanding}} = \frac{\$195,000 - \$15,000}{50,000 \text{ shares}} = \frac{\$180,000}{50,000 \text{ shares}} = \$3.60$$

b. The increase in the earnings per share from \$3.60 to \$4.40 indicates a favorable trend in the company's profitability.

.....

Practice Exercises: PE 11-8A, PE 11-8B

# At a Glance 11



#### Describe the nature of the corporate form of organization.

**Key Points** Corporations have a separate legal existence, transferable units of stock, unlimited life, and limited stockholders' liability. The advantages and disadvantages of the corporate form are summarized in Exhibit 2. Costs incurred in organizing a corporation are debited to Organizational Expenses.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe the characteristics of corporations.		
• List the advantages and disadvantages of the corporate form.		
• Prepare a journal entry for the costs of organizing a corporation.		



#### Describe and illustrate the characteristics of stock, classes of stock, and entries for issuing stock.

**Key Points** The main source of paid-in capital is from issuing common and preferred stock. Stock issued at par is recorded by debiting Cash and crediting the class of stock issued for its par amount. Stock issued for more than par is recorded by debiting Cash, crediting the class of stock for its par, and crediting Paid-In Capital in Excess of Par for the difference. When no-par stock is issued, the entire proceeds are credited to the stock account. No-par stock may be assigned a stated value per share, and the excess of the proceeds over the stated value may be credited to Paid-In Capital in Excess of Stated Value.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the characteristics of common and preferred stock including rights to dividends.</li> </ul>	EE11-1	PE11-1A, 11-1B
• Journalize the entry for common and preferred stock issued at par.	EE11-2	PE11-2A, 11-2B
<ul> <li>Journalize the entry for common and preferred stock issued at more than par.</li> </ul>	EE11-2	PE11-2A, 11-2B
• Journalize the entry for issuing no-par stock.	EE11-2	PE11-2A, 11-2B



#### Describe and illustrate the accounting for cash dividends and stock dividends.

**Key Points** The entry to record a declaration of cash dividends debits Dividends and credits Dividends Payable. When a stock dividend is declared, Stock Dividends is debited for the fair value of the stock to be issued. Stock Dividends Distributable is credited for the par or stated value of the common stock to be issued. The difference between the fair value of the stock and its par or stated value is credited to Paid-In Capital in Excess of Par—Common Stock. When the stock is issued on the date of payment, Stock Dividends Distributable is debited and Common Stock is credited for the par or stated value of the stock issued.

Learning Outcomes  • Journalize the entries for the declaration and payment of cash dividends.	Example Exercises EE11-3	Practice Exercises PE11-3A, 11-3B
• Journalize the entries for the declaration and payment of stock dividends.	EE11-4	PE11-4A, 11-4B



#### Describe and illustrate the accounting for treasury stock transactions.

**Key Points** When a corporation buys its own stock, the cost method of accounting is normally used. Treasury Stock is debited for its cost, and Cash is credited. If the stock is resold, Treasury Stock is credited for its cost and any difference between the cost and the selling price is normally debited or credited to Paid-In Capital from Sale of Treasury Stock.

Learning Outcomes	Example Exercises	Practice Exercises
Define treasury stock.		
• Describe the accounting for treasury stock.		
• Journalize entries for the purchase and sale of treasury stock.	EE11-5	PE11-5A, 11-5B



### Describe and illustrate the reporting of stockholders' equity.

**Key Points** Two alternatives for reporting stockholders' equity are shown in Exhibit 6. Changes in retained earnings are reported in a retained earnings statement, as shown in Exhibit 7. Restrictions to retained earnings should be disclosed. Any prior period adjustments are reported in the retained earnings statement. Changes in stockholders' equity may be reported on a statement of stockholders' equity, as shown in Exhibit 8.

Learning Outcomes	Example Exercises	Practice Exercises	
• Prepare the Stockholders' Equity section of the balance sheet.	EE11-6	PE11-6A, 11-6B	
• Prepare a retained earnings statement.	EE11-7	PE11-7A, 11-7B	
• Describe retained earnings restrictions and prior period adjustments.			
• Prepare a statement of stockholders' equity.			



#### Describe the effect of stock splits on corporate financial statements.

**Key Points** When a corporation reduces the par or stated value of its common stock and issues a proportionate number of additional shares, a stock split has occurred. There are no changes in the balances of any accounts, and no entry is required for a stock split.

Learning Outcomes	Example Exercises	Practice Exercises
• Define and give an example of a stock split.		
• Describe the accounting for and effects of a stock split on the financial statements.		



#### Describe and illustrate the use of earnings per share in evaluating a company's profitability.

**Key Points** The profitability of companies is often expressed as earnings per share. Earnings per share is computed by subtracting preferred dividends from net income and dividing by the average number of common shares outstanding.

Learning Outcomes	Example Exercises	Practice Exercises	
• Describe the use of earnings per share in evaluating a company's profitability.			
• Compute and interpret earnings per share.	EE11-8	PE11-8A, 11-8B	

# **Key Terms**

cash dividend (508) common stock (503) cumulative preferred stock (503) discount (505) earnings per common share (EPS) (518) in arrears (503) outstanding stock (502) par value (503) preferred stock (503) premium (505) prior period adjustment (515) restrictions (515) retained earnings statement (514) statement of stockholders' equity (516) stock (500) stock dividend (510) stock split (517) stockholders (500) treasury stock (511)

# **Illustrative Problem**

Altenburg Inc. is a lighting fixture wholesaler located in Arizona. During its current fiscal year, ended December 31, 2016, Altenburg Inc. completed the following selected transactions:

- Feb. 3. Purchased 2,500 shares of its own common stock at \$26, recording the stock at cost. (Prior to the purchase, there were 40,000 shares of \$20 par common stock outstanding.)
- May 1. Declared a semiannual dividend of \$1 on the 10,000 shares of preferred stock and a \$0.30 dividend on the common stock to stockholders of record on May 31, payable on June 15.
- June 15. Paid the cash dividends.
- Sept. 23. Sold 1,000 shares of treasury stock at \$28, receiving cash.
- Nov. 1. Declared semiannual dividends of \$1 on the preferred stock and \$0.30 on the common stock. In addition, a 5% common stock dividend was declared on the common stock outstanding, to be capitalized at the fair market value of the common stock, which is estimated at \$30.
- Dec. 1. Paid the cash dividends and issued the certificates for the common stock dividend.

### **Instructions**

Journalize the entries to record the transactions for Altenburg Inc.

### **Solution**

²⁰¹⁶ Feb.	3	Treasury Stock Cash	65,000	65,000
May	1	Cash Dividends  Cash Dividends Payable  (10,000 × \$1) + [(40,000 – 2,500) × \$0.30].	21,250	21,250
June	15	Cash Dividends Payable Cash	21,250	21,250
Sept.	23	Cash Treasury Stock Paid-In Capital from Sale of Treasury Stock	28,000	26,000 2,000
Nov.	1	Cash Dividends  Cash Dividends Payable  (10,000 × \$1) + [(40,000 – 1,500) × \$0.30].	21,550	21,550
	1	Stock Dividends Stock Dividends Distributable Paid-In Capital in Excess of Par—Common Stock *(40,000 – 1,500) × 5% × \$30.	57,750*	38,500 19,250
Dec.	1	Cash Dividends Payable Stock Dividends Distributable Cash Common Stock	21,550 38,500	21,550 38,500

# **Discussion Questions**

- 1. Of two corporations organized at approximately the same time and engaged in competing businesses, one issued \$80 par common stock, and the other issued \$1 par common stock. Do the par designations provide any indication as to which stock is preferable as an investment? Explain.
- A stockbroker advises a client to "buy preferred stock... With that type of stock,... [you] will never have to worry about losing the dividends." Is the broker right?
- 3. A corporation with both preferred stock and common stock outstanding has a substantial credit balance in its retained earnings account at the beginning of the current fiscal year. Although net income for the current year is sufficient to pay the preferred dividend of \$150,000 each quarter and a common dividend of \$90,000 each quarter, the board of directors declares dividends only on the preferred stock. Suggest possible reasons for passing the dividends on the common stock.
- An owner of 2,500 shares of Simmons Company common stock receives a stock dividend of 50 shares.
  - a. What is the effect of the stock dividend on the stockholder's proportionate interest (equity) in the corporation?
  - b. How does the total equity of 2,550 shares compare with the total equity of 2,500 shares before the stock dividend?

- 5. a. Where should a declared but unpaid cash dividend be reported on the balance sheet?
  - b. Where should a declared but unissued stock dividend be reported on the balance sheet?
- A corporation reacquires 60,000 shares of its own \$10 par common stock for \$3,000,000, recording it at cost.
  - a. What effect does this transaction have on revenue or expense of the period?
  - b. What effect does it have on stockholders' equity?
- 7. The treasury stock in Discussion Question 6 is resold for \$3,750,000.
  - a. What is the effect on the corporation's revenue of the period?
  - b. What is the effect on stockholders' equity?
- 8. What are the three classifications of restrictions of retained earnings, and how are such restrictions normally reported on the financial statements?
- 9. Indicate how prior period adjustments would be reported on the financial statements presented only for the current period.
- 10. What is the primary purpose of a stock split?

# **Practice Exercises**

**EE 11-1** p. 504

#### PE 11-1A Dividends per share

OBJ. 2



National Furniture Company has 25,000 shares of cumulative preferred 2% stock, \$75 par and 200,000 shares of \$10 par common stock. The following amounts were distributed as dividends:

Year 1 \$25,000 Year 2 88,000 Year 3 95,500

Determine the dividends per share for preferred and common stock for each year.

#### **EE 11-1** p. 504

#### PE 11-1B Dividends per share

OBJ. 2



MF HOW

Zero Calories Company has 16,000 shares of cumulative preferred 1% stock, \$40 par and 80,000 shares of \$150 par common stock. The following amounts were distributed as dividends:

Year 1 \$ 21,600 Year 2 4,000 Year 3 100,800

Determine the dividends per share for preferred and common stock for each year.

#### **EE 11-2** *p. 507*

#### PE 11-2A Entries for issuing stock

OBJ. 2

On August 26, Mountain Realty Inc. issued for cash 120,000 shares of no-par common stock (with a stated value of \$5) at \$8. On October 1, Mountain Realty Inc. issued at par value 40,000 shares of preferred 1% stock, \$10 par for cash. On November 30, Mountain Realty Inc. issued for cash 18,000 shares of preferred 1% stock, \$10 par at \$13.

Journalize the entries to record the August 26, October 1, and November 30 transactions.

#### **EE 11-2** p. 507

#### PE 11-2B Entries for issuing stock

OBJ. 2

On January 22, Zentric Corporation issued for cash 180,000 shares of no-par common stock at \$4. On February 14, Zentric Corporation issued at par value 44,000 shares of preferred 2% stock, \$55 par for cash. On August 30, Zentric Corporation issued for cash 9,000 shares of preferred 2% stock, \$55 par at \$60.

Journalize the entries to record the January 22, February 14, and August 30 transactions.

# HOW

#### EE 11-3 p. 509 PE 11-3A Entries for cash dividends

OBJ. 3

The declaration, record, and payment dates in connection with a cash dividend of \$710,000 on a corporation's common stock are June 15, August 10, and September 15. Journalize the entries required on each date.



#### EE 11-3 p. 509 PE 11-3B Entries for cash dividends

OBJ. 3

The declaration, record, and payment dates in connection with a cash dividend of \$480,000 on a corporation's common stock are February 1, March 18, and May 1. Journalize the entries required on each date.



ME HOW

SHOW ME HOW

#### EE 11-4 p. 511 PE 11-4A Entries for stock dividends

OBJ. 3

Olde Wine Corporation has 250,000 shares of \$40 par common stock outstanding. On February 15, Olde Wine Corporation declared a 2% stock dividend to be issued May 2 to stockholders of record on March 27. The market price of the stock was \$52 per share on February 15.

Journalize the entries required on February 15, March 27, and May 2.

#### ----

### PE 11-4B Entries for stock dividends

OBJ. 3

Antique Buggy Corporation has 820,000 shares of \$35 par common stock outstanding. On June 8, Antique Buggy Corporation declared a 5% stock dividend to be issued August 12 to stockholders of record on July 13. The market price of the stock was \$63 per share on June 8.

Journalize the entries required on June 8, July 13, and August 12.

#### **EE 11-5** p. 512

#### PE 11-5A Entries for treasury stock

OBJ. 4

On January 31, Wilderness Resorts Inc. reacquired 22,500 shares of its common stock at \$31 per share. On April 20, Wilderness Resorts sold 12,800 of the reacquired shares at \$40 per share. On October 4, Wilderness Resorts sold the remaining shares at \$28 per share. Journalize the transactions of January 31, April 20, and October 4.



#### **EE 11-5** *p. 512* **P**

#### PE 11-5B Entries for treasury stock

OBJ. 4



On May 27, Hydro Clothing Inc. reacquired 75,000 shares of its common stock at \$8 per share. On August 3, Hydro Clothing sold 54,000 of the reacquired shares at \$11 per share. On November 14, Hydro Clothing sold the remaining shares at \$7 per share.

Journalize the transactions of May 27, August 3, and November 14.

#### **EE 11-6** *p. 514*

#### PE 11-6A Reporting stockholders' equity

OBJ. 5



Using the following accounts and balances, prepare the Stockholders' Equity section of the balance sheet. Two hundred fifty thousand shares of common stock are authorized, and 17,500 shares have been reacquired.

Common Stock, \$60 par	\$12,000,0000
Paid-In Capital from Sale of Treasury Stock	320,000
Paid-In Capital in Excess of Par—Common Stock	3,200,000
Retained Earnings	18,500,000
Treasury Stock	1,137,500

#### **EE 11-6** n 514

#### PE 11-6B Reporting stockholders' equity

OBJ. 5



Using the following accounts and balances, prepare the Stockholders' Equity section of the balance sheet. Five-hundred thousand shares of common stock are authorized, and 40,000 shares have been reacquired.

Common Stock, \$120 par	\$48,000,000
Paid-In Capital from Sale of Treasury Stock	4,500,000
Paid-In Capital in Excess of Par—Common Stock	6,400,000
Retained Earnings	63,680,000
Treasury Stock	5,200,000

#### **EE 11-7** p. 515

#### PE 11-7A Retained earnings statement

OBJ. 5



Rockwell Inc. reported the following results for the year ended June 30, 2016:

	, j v v,
Retained earnings, July 1, 2015	\$3,900,000
Net income	714,000
Cash dividends declared	100,000
Stock dividends declared	50,000

Prepare a retained earnings statement for the fiscal year ended June 30, 2016.

#### **EE 11-7** p. 515

#### PE 11-7B Retained earnings statement

OBJ. 5



Noric Cruises Inc. reported the following results for the year ended October 31, 2016:

Retained earnings, November 1, 2015	\$12,400,000
Net income	2,350,000
Cash dividends declared	175,000
Stock dividends declared	300,000

Prepare a retained earnings statement for the fiscal year ended October 31, 2016.

#### **EE 11-8** *p. 519*

#### PE 11-8A Earnings per share

OBJ. 7



Financial statement data for the years ended December 31 for Dovetail Corporation follows:

	2016	2015
Net income	\$448,750	\$376,000
Preferred dividends	\$40,000	\$40,000
Average number of common shares outstanding	75,000 shares	60,000 shares

- a. Determine the earnings per share for 2016 and 2015.
- b. Does the change in the earnings per share from 2015 to 2016 indicate a favorable or an unfavorable trend?

**EE 11-8** *p. 519* 

#### PE 11-8B Earnings per share

**OBJ. 7** 

80,000 shares

115,000 shares





 2016
 2015

 Net income
 \$2,485,700
 \$1,538,000

 Preferred dividends
 \$50,000
 \$50,000

Financial statement data for the years ended December 31 for Black Bull Inc. follows:

a. Determine the earnings per share for 2016 and 2015.

Average number of common shares outstanding

b. Does the change in the earnings per share from 2015 to 2016 indicate a favorable or an unfavorable trend?

### Exercises

#### EX 11-1 Dividends per share

OBJ. 2

✓ Preferred stock, 1st year: \$2.25



✓ Preferred stock, 1st year: \$0.90







Triple Z Inc., a developer of radiology equipment, has stock outstanding as follows: 12,000 shares of cumulative preferred 2% stock, \$150 par and 50,000 shares of \$10 par common. During its first four years of operations, the following amounts were distributed as dividends: first year, \$27,000; second year, \$60,000; third year, \$80,000; fourth year, \$90,000. Calculate the dividends per share on each class of stock for each of the four years.

#### EX 11-2 Dividends per share

OBJ. 2

Lightfoot Inc., a software development firm, has stock outstanding as follows: 40,000 shares of cumulative preferred 1% stock, \$125 par, and 100,000 shares of \$150 par common. During its first four years of operations, the following amounts were distributed as dividends: first year, \$36,000; second year, \$58,000; third year, \$75,000; fourth year, \$124,000. Calculate the dividends per share on each class of stock for each of the four years.

#### EX 11-3 Entries for issuing par stock

OBJ. 2

On April 20, Gallatin County Rocks Inc., a marble contractor, issued for cash 75,000 shares of \$45 par common stock at \$54, and on August 7, it issued for cash 20,000 shares of preferred stock, \$10 par at \$12.

- a. Journalize the entries for April 20 and August 7.
- b. What is the total amount invested (total paid-in capital) by all stockholders as of August 7?

#### EX 11-4 Entries for issuing no-par stock

OBJ. 2

On May 15, Helena Carpet Inc., a carpet wholesaler, issued for cash 750,000 shares of nopar common stock (with a stated value of \$1.50) at \$4, and on June 30, it issued for cash 17,500 shares of preferred stock, \$50 par at \$60.

- a. Journalize the entries for May 15 and June 30, assuming that the common stock is to be credited with the stated value.
- b. What is the total amount invested (total paid-in capital) by all stockholders as of June 30?

#### EX 11-5 Issuing stock for assets other than cash

OBJ. 2

On July 11, American Lift Corporation, a wholesaler of hydraulic lifts, acquired land in exchange for 5,000 shares of \$5 par common stock with a current market price of \$32. Journalize the entry to record the transaction.

#### EX 11-6 Selected stock transactions

OBJ. 2

Alpha Sounds Corp., an electric guitar retailer, was organized by Michele Kirby, Paul Glenn, and Gretchen Northway. The charter authorized 1,000,000 shares of common stock with a par of \$1. The following transactions affecting stockholders' equity were completed during the first year of operations:

- a. Issued 100,000 shares of stock at par to Paul Glenn for cash.
- b. Issued 3,000 shares of stock at par to Michele Kirby for promotional services provided in connection with the organization of the corporation, and issued 45,000 shares of stock at par to Michele Kirby for cash.

(Continued)

c. Purchased land and a building from Gretchen Northway in exchange for stock issued at par. The building is mortgaged for \$180,000 for 20 years at 6%, and there is accrued interest of \$5,200 on the mortgage note at the time of the purchase. It is agreed that the land is to be priced at \$60,000 and the building at \$225,000 and that Gretchen Northway's equity will be exchanged for stock at par. The corporation agreed to assume responsibility for paying the mortgage note and the accrued interest.

Journalize the entries to record the transactions.

#### EX 11-7 Issuing stock

OBJ. 2

Willow Creek Nursery, with an authorization of 75,000 shares of preferred stock and 200,000 shares of common stock, completed several transactions involving its stock on October 1, the first day of operations. The trial balance at the close of the day follows:

Cash	3,780,000	
Land	840,000	
Buildings	2,380,000	
Preferred 1% Stock, \$80 par		2,800,000
Paid-In Capital in Excess of Par—Preferred Stock		420,000
Common Stock, \$30 par		3,600,000
Paid-In Capital in Excess of Par—Common Stock		_180,000
	7,000,000	7,000,000

All shares within each class of stock were sold at the same price. The preferred stock was issued in exchange for the land and buildings.

Journalize the two entries to record the transactions summarized in the trial balance.

#### EX 11-8 Issuing stock

OBJ. 2

Occupational Products Inc., a wholesaler of office products, was organized on March 1 of the current year, with an authorization of 25,000 shares of preferred 2% stock, \$100 par and 500,000 shares of \$10 par common stock. The following selected transactions were completed during the first year of operations:

- Mar. 1. Issued 220,000 shares of common stock at par for cash.
  - 1. Issued 500 shares of common stock at par to an attorney in payment of legal fees for organizing the corporation.
- May 31. Issued 70,000 shares of common stock in exchange for land, buildings, and equipment with fair market prices of \$150,000, \$560,000 and \$165,000 respectively.
- July 1. Issued 18,000 shares of preferred stock at \$110 for cash.

Journalize the transactions.

#### EX 11-9 Entries for cash dividends

OBJ. 3

The declaration, record, and payment dates in connection with a cash dividend of \$135,000 on a corporation's common stock are January 12, March 13, and April 12. Journalize the entries required on each date.

#### EX 11-10 Entries for stock dividends

OBJ. 3

Senior Life Co. is an HMO for businesses in the Portland area. The following account balances appear on the balance sheet of Senior Life Co.: Common stock (800,000 shares authorized; 500,000 shares issued), \$4 par, \$2,000,000; Paid-in capital in excess of par—common stock, \$1,000,000; and Retained earnings, \$33,500,000. The board of directors declared a 2% stock dividend when the market price of the stock was \$13 a share. Senior Life Co. reported no income or loss for the current year.

- a. Journalize the entries to record (1) the declaration of the dividend, capitalizing an amount equal to market value, and (2) the issuance of the stock certificates.
- b. Determine the following amounts before the stock dividend was declared: (1) total paid-in capital, (2) total retained earnings, and (3) total stockholders' equity.
- c. Determine the following amounts after the stock dividend was declared and closing entries were recorded at the end of the year: (1) total paid-in capital, (2) total retained earnings, and (3) total stockholders' equity.





✓ b. (1) \$3,000,000(3) \$36,500,000



#### EX 11-11 Treasury stock transactions

OBJ. 4

✓ b. \$170,000 credit



Mystic Lake Inc. bottles and distributes spring water. On July 9 of the current year, Mystic Lake reacquired 40,000 shares of its common stock at \$44 per share. On September 22, Mystic Lake Inc. sold 30,000 of the reacquired shares at \$50 per share. The remaining 10,000 shares were sold at \$43 per share on November 23.

- a. Journalize the transactions of July 9, September 22, and November 23.
- b. What is the balance in Paid-In Capital from Sale of Treasury Stock on December 31 of the current year?
- c. For what reasons might Mystic Lake have purchased the treasury stock?

#### EX 11-12 Treasury stock transactions

OBJ. 4, 5

✓ b. \$57,000 credit



Lawn Smart Inc. develops and produces spraying equipment for lawn maintenance and industrial uses. On May 29 of the current year, Lawn Smart Inc. reacquired 18,000 shares of its common stock at \$20 per share. On August 11, 13,500 of the reacquired shares were sold at \$24 per share, and on October 30, 3,000 of the reacquired shares were sold at \$21.

- a. Journalize the transactions of May 29, August 11, and October 30.
- b. What is the balance in Paid-In Capital from Sale of Treasury Stock on December 31 of the current year?
- c. What is the balance in Treasury Stock on December 31 of the current year?
- d. How will the balance in Treasury Stock be reported on the balance sheet?

#### **EX 11-13** Treasury stock transactions

OBJ. 4. 5

✓ b. \$55,500 credit

Biscayne Bay Water Inc. bottles and distributes spring water. On May 14 of the current year, Biscayne Bay Water Inc. reacquired 23,500 shares of its common stock at \$75 per share. On September 6, Biscayne Bay Water Inc. sold 14,000 of the reacquired shares at \$81 per share. The remaining 9,500 shares were sold at \$72 per share on November 30.

- a. Journalize the transactions of May 14, September 6, and November 30.
- b. What is the balance in Paid-In Capital from Sale of Treasury Stock on December 31 of the current year?
- c. Where will the balance in Paid-In Capital from Sale of Treasury Stock be reported on the balance sheet?
- d. For what reasons might Biscayne Bay Water Inc. have purchased the treasury stock?

### EX 11-14 Reporting paid-in capital

OBJ. 5

✓ Total paid-in capital, \$13,615,000 The following accounts and their balances were selected from the unadjusted trial balance of Point Loma Group Inc., a freight forwarder, at October 31, the end of the current fiscal year:

Common Stock, no par, \$14 stated value	\$ 4,480,000
Paid-In Capital from Sale of Treasury Stock	45,000
Paid-In Capital in Excess of Par—Preferred Stock	210,000
Paid-In Capital in Excess of Stated Value—Common Stock	480,000
Preferred 2% Stock, \$120 par	8,400,000
Retained Earnings	39,500,000

Prepare the Paid-In Capital portion of the Stockholders' Equity section of the balance sheet using Method 1 of Exhibit 6. There are 375,000 shares of common stock authorized and 85,000 shares of preferred stock authorized.

#### EX 11-15 Stockholders' Equity section of balance sheet

OBJ. 5

✓ Total stockholders' equity, \$23,676,000

The following accounts and their balances appear in the ledger of Goodale Properties Inc. on June 30 of the current year:

Common Stock, \$45 par	\$ 3,060,000
Paid-In Capital from Sale of Treasury Stock	115,000
Paid-In Capital in Excess of Par—Common Stock	272,000
Retained Earnings	20,553,000
Treasury Stock	324,000

Prepare the Stockholders' Equity section of the balance sheet as of June 30. Eighty thousand shares of common stock are authorized, and 9,000 shares have been reacquired.

#### EX 11-16 Stockholders' Equity section of balance sheet

OBJ. 5

✓ Total stockholders' equity, \$89,100,000

Specialty Auto Racing Inc. retails racing products for BMWs, Porsches, and Ferraris. The following accounts and their balances appear in the ledger of Specialty Auto Racing Inc. on July 31, the end of the current year:

Common Stock, \$36 par	\$10,080,000
Paid-In Capital from Sale of Treasury Stock—Common	340,000
Paid-In Capital in Excess of Par—Common Stock	420,000
Paid-In Capital in Excess of Par—Preferred Stock	384,000
Preferred 1% Stock, \$150 par	7,200,000
Retained Earnings	71,684,000
Treasury Stock—Common	1,008,000

Fifty thousand shares of preferred and 300,000 shares of common stock are authorized. There are 24,000 shares of common stock held as treasury stock.

Prepare the Stockholders' Equity section of the balance sheet as of July 31, the end of the current year using Method 1 of Exhibit 6.

#### EX 11-17 Retained earnings statement

OBJ. 5

Sumter Pumps Corporation, a manufacturer of industrial pumps, reports the following results for the year ended January 31, 2016:

Retained earnings, February 1, 2015	\$59,650,000
Net income	8,160,000
Cash dividends declared	1,000,000
Stock dividends declared	2,600,000

Prepare a retained earnings statement for the fiscal year ended January 31, 2016.

#### EX 11-18 Stockholders' Equity section of balance sheet

OBJ. 5

\$127,340,000

List the errors in the following Stockholders' Equity section of the balance sheet prepared as of the end of the current year:

#### Stockholders' Equity Paid-in capital:

\$10,000,000	
500,000	\$ 10,500,000
	96,700,000
	1,755,000
	430,000
	\$ 109,385,000
	17,655,000
	300,000
	500,000

✓ Corrected total

stockholders' equity,

\$122,800,000

Retained earnings,

January 31,

\$64,210,000

Total stockholders' equity.....

✓ Total stockholders' equity, Dec. 31, \$21,587,000

#### EX 11-19 Statement of stockholders' equity

OBJ. 5

The stockholders' equity T accounts of I-Cards Inc. for the fiscal year ended December 31, 2016, are as follows. Prepare a statement of stockholders' equity for the fiscal year ended December 31, 2016.

		соммо	N STOCK		
			Jan. 1	Balance	4,800,000
			Apr. 14	Issued	
				30,000 shares	1,200,000
			Dec. 31	Balance	6,000,000
	PAID	-IN CAPITAL	IN EXCESS	OF PAR	
			Jan. 1	Balance	960,000
			Apr. 14	Issued	
				30,000 shares	300,000
			Dec. 31	Balance	1,260,000
		TREASUF	Y STOCK		
Aug. 7	Purchased				
	12,000 shares	552,000			
		RETAINED	EARNINGS	;	
Mar. 31	Dividend	69,000	Jan. 1	Balance	11,375,000
June 30	Dividend	69,000	Dec. 31	Closing	
Sept. 30	Dividend	69,000		(net income)	3,780,000
Dec. 31	Dividend	69,000	Dec. 31	Balance	14,879,000

#### EX 11-20 Effect of stock split

OBJ. 6

Copper Grill Restaurant Corporation wholesales ovens and ranges to restaurants throughout the Southwest. Copper Grill Restaurant Corporation, which had 50,000 shares of common stock outstanding, declared a 3-for-1 stock split.

- a. What will be the number of shares outstanding after the split?
- b. If the common stock had a market price of \$210 per share before the stock split, what would be an approximate market price per share after the split?

### EX 11-21 Effect of cash dividend and stock split

**OBJ. 3, 6** 

Indicate whether the following actions would (+) increase, (-) decrease, or (0) not affect Indigo Inc.'s total assets, liabilities, and stockholders' equity:

		Assets	Liabilities	Stockholders' Equity
(1)	Authorizing and issuing stock certificates			
	in a stock split			
(2)	Declaring a stock dividend			
(3)	Issuing stock certificates for the stock dividend declared in (2)			
(4)	Declaring a cash dividend			
(5)	Paying the cash dividend declared in (4)			

#### EX 11-22 Selected dividend transactions, stock split

Selected transactions completed by Canyon Ferry Boating Corporation during the current fiscal year are as follows:

- Jan. 8. Split the common stock 2 for 1 and reduced the par from \$80 to \$40 per share. After the split, there were 150,000 common shares outstanding.
- Apr. 30. Declared semiannual dividends of \$0.75 on 18,000 shares of preferred stock and \$0.28 on the common stock payable on July 1.

(Continued)

Oct. 31. Declared semiannual dividends of \$0.75 on the preferred stock and \$0.14 on the common stock (before the stock dividend). In addition, a 5% common stock dividend was declared on the common stock outstanding. The fair market value of the common stock is estimated at \$52.

Dec. 31. Paid the cash dividends and issued the certificates for the common stock dividend. Journalize the transactions.

EX 11-23 EPS OBJ. 7

Junkyard Arts, Inc., had earnings of \$316,000 for 2016. The company had 40,000 shares of common stock outstanding during the year. In addition, the company issued 15,000 shares of \$50 par value preferred stock on January 9, 2016. The preferred stock has a dividend of \$1.60 per share. There were no transactions in either common or preferred stock during 2016.

Determine the basic earnings per share for Junkyard Arts.

EX 11-24 EPS OBJ. 7

Pacific Gas and Electric Company is a large gas and electric utility operating in northern and central California. Three recent years of financial data for Pacific Gas and Electric Company are as follows:

Fiscal Years Ended

	(in millions)		
	Year 3	Year 2	Year 1
Net income	\$830	\$858	\$1,113
Preferred dividends	\$14	\$14	\$14
Average number of common shares outstanding	424	401	382

- a. Determine the earnings per share for fiscal Year 3, Year 2, and Year 1. Round to the nearest cent.
- b. Evaluate the growth in earnings per share for the three years in comparison to the growth in net income for the three years.

EV 44 0F EDG

EX 11-25 EPS OBJ. 7

For a recent year, OfficeMax and Staples are two companies competing in the retail office supply business. OfficeMax had a net income of \$34,894,000, while Staples had a net loss of \$210,706,000. OfficeMax had preferred stock of \$28,726,000 with preferred dividends of \$2,123,000. Staples had no preferred stock. The average outstanding common shares for each company were as follows:

	Average Number of Common Shares Outstanding
OfficeMax	85,881,000
Staples	669,479,000

- a. Determine the earnings per share for each company. Round to the nearest cent.
- b. Evaluate the relative profitability of the two companies.







## **Problems: Series A**

✓ 1. Common dividends in 2013: \$36,000





#### PR 11-1A Dividends on preferred and common stock

OBJ. 2

Sunbird Theatre Inc. owns and operates movie theaters throughout Florida and Georgia. Sunbird Theatre Inc. has declared the following annual dividends over a six-year period: 2011, \$20,000; 2012, \$36,000; 2013, \$70,000; 2014, \$90,000; 2015, \$100,000 and 2016, \$150,000. During the entire period ended December 31 of each year, the outstanding stock of the company was composed of 100,000 shares of cumulative, preferred 1% stock, \$30 par, and 400,000 shares of common stock, \$20 par.

#### **Instructions**

1. Calculate the total dividends and the per-share dividends declared on each class of stock for each of the six years. There were no dividends in arrears on January 1, 2011. Summarize the data in tabular form, using the following column headings:

	Total Dividends	Preferred Dividends		<b>Common Dividends</b>	
Year		Total	Per Share	Total	Per Share
2011	\$ 20,000				
2012	36,000				
2013	70,000				
2014	90,000				
2015	102,000				
2016	150,000				

- 2. Calculate the average annual dividend per share for each class of stock for the six-year period.
- 3. Assuming a market price per share of \$37.50 for the preferred stock and \$30.00 for the common stock, calculate the average annual percentage return on initial shareholders' investment, based on the average annual dividend per share (a) for preferred stock and (b) for common stock.

#### PR 11-2A Stock transactions for corporate expansion

OBJ. 2

On December 1 of the current year, the following accounts and their balances appear in the ledger of Latte Corp., a coffee processor:

Preferred 2% Stock, \$50 par (250,000 shares authorized,	
80,000 shares issued)	\$ 4,000,000
Paid-In Capital in Excess of Par—Preferred Stock	560,000
Common Stock, \$35 par (1,000,000 shares authorized,	
400,000 shares issued)	14,000,000
Paid-In Capital in Excess of Par—Common Stock	1,200,000
Retained Earnings	180,000,000

At the annual stockholders' meeting on March 31, the board of directors presented a plan for modernizing and expanding plant operations at a cost of approximately \$11,000,000. The plan provided (a) that a building, valued at \$3,375,000, and the land on which it is located, valued at \$1,500,000, be acquired in accordance with preliminary negotiations by the issuance of 125,000 shares of common stock, (b) that 40,000 shares of the unissued preferred stock be issued through an underwriter, and (c) that the corporation borrow \$4,000,000. The plan was approved by the stockholders and accomplished by the following transactions:

- May 11. Issued 125,000 shares of common stock in exchange for land and a building, according to the plan.
  - 20. Issued 40,000 shares of preferred stock, receiving \$52 per share in cash.
  - 31. Borrowed \$4,000,000 from Laurel National, giving a 5% mortgage note.

#### Instructions

Journalize the entries to record the May transactions.

General Ledger

#### PR 11-3A Selected stock transactions

OBJ. 2, 3, 4

✓ f. Cash dividends, \$243,000

General Ledger

The following selected accounts appear in the ledger of EJ Construction Inc. at the beginning of the current fiscal year:

Preferred 1% Stock, \$50 par (100,000 shares authorized,	
80,000 shares issued)	\$ 4,000,000
Paid-In Capital in Excess of Par—Preferred Stock	175,000
Common Stock, \$3 par (5,000,000 shares authorized,	
2,000,000 shares issued)	6,000,000
Paid-In Capital in Excess of Par—Common Stock	1,500,000
Retained Earnings	32,350,000

During the year, the corporation completed a number of transactions affecting the stockholders' equity. They are summarized as follows:

- a. Issued 500,000 shares of common stock at \$8, receiving cash.
- b. Issued 10,000 shares of preferred 1% stock at \$60.
- c. Purchased 50,000 shares of treasury common for \$7 per share.
- d. Sold 20,000 shares of treasury common for \$9 per share.
- e. Sold 5,000 shares of treasury common for \$6 per share.
- f. Declared cash dividends of \$0.50 per share on preferred stock and \$0.08 per share on common stock.
- g. Paid the cash dividends.

#### **Instructions**

Journalize the entries to record the transactions. Identify each entry by letter.

#### PR 11-4A Entries for selected corporate transactions

OBJ. 2, 3, 4, 5

Morrow Enterprises Inc. manufactures bathroom fixtures. The stockholders' equity accounts of Morrow Enterprises Inc., with balances on January 1, 2016, are as follows:

Common Stock, \$20 stated value (500,000 shares	
authorized, 375,000 shares issued)	\$ 7,500,000
Paid-In Capital in Excess of Stated Value—Common Stock	825,000
Retained Earnings	33,600,000
Treasury Stock (25,000 shares, at cost)	450.000

The following selected transactions occurred during the year:

- Jan. 22. Paid cash dividends of \$0.08 per share on the common stock. The dividend had been properly recorded when declared on December 1 of the preceding fiscal year for \$28,000.
- Apr. 10. Issued 75,000 shares of common stock for \$24 per share.
- June 6. Sold all of the treasury stock for \$26 per share.
- July 5. Declared a 4% stock dividend on common stock, to be capitalized at the market price of the stock, which is \$25 per share.
- Aug. 15. Issued the certificates for the dividend declared on July 5.
- Nov. 23. Purchased 30,000 shares of treasury stock for \$19 per share.
- Dec. 28. Declared a \$0.10-per-share dividend on common stock.
  - 31. Closed the credit balance of the income summary account, \$1,125,000.
  - 31. Closed the two dividends accounts to Retained Earnings.

✓ 4. Total stockholders' equity, \$44,436,200



General Ledger

#### **Instructions**

- 1. Enter the January 1 balances in T accounts for the stockholders' equity accounts listed. Also prepare T accounts for the following: Paid-In Capital from Sale of Treasury Stock; Stock Dividends Distributable; Stock Dividends; Cash Dividends.
- 2. Journalize the entries to record the transactions, and post to the eight selected accounts.
- 3. Prepare a retained earnings statement for the year ended December 31, 2016.
- 4. Prepare the Stockholders' Equity section of the December 31, 2016, balance sheet.

#### PR 11-5A Entries for selected corporate transactions

OBJ. 2, 3, 4, 6

✓ Oct. 1, cash dividends, \$202,800

General Ledger

Selected transactions completed by Primo Discount Corporation during the current fiscal year are as follows:

- Jan. 9. Split the common stock 3 for 1 and reduced the par from \$75 to \$25 per share. After the split, there were 1,200,000 common shares outstanding.
- Feb. 28. Purchased 40,000 shares of the corporation's own common stock at \$28, recording the stock at cost.
- May 1. Declared semiannual dividends of \$0.80 on 75,000 shares of preferred stock and \$0.12 on the common stock to stockholders of record on June 1, payable on July 10.
- July 10. Paid the cash dividends.
- Sept. 7. Sold 30,000 shares of treasury stock at \$34, receiving cash.
- Oct. 1. Declared semiannual dividends of \$0.80 on the preferred stock and \$0.12 on the common stock (before the stock dividend). In addition, a 2% common stock dividend was declared on the common stock outstanding. The fair market value of the common stock is estimated at \$36.
- Dec. 1. Paid the cash dividends and issued the certificates for the common stock dividend.

#### **Instructions**

Journalize the transactions.

# **Problems: Series B**

#### PR 11-1B Dividends on preferred and common stock

OBJ. 2

Yosemite Bike Corp. manufactures mountain bikes and distributes them through retail outlets in California, Oregon, and Washington. Yosemite Bike Corp. has declared the following annual dividends over a six-year period ended December 31 of each year: 2011, \$24,000; 2012, \$10,000; 2013, \$126,000; 2014, \$100,000; 2015, \$125,000; and 2016, \$125,000. During the entire period, the outstanding stock of the company was composed of 25,000 shares of cumulative preferred 2% stock, \$90 par, and 100,000 shares of common stock, \$4 par.

### Instructions

1. Determine the total dividends and the per-share dividends declared on each class of stock for each of the six years. There were no dividends in arrears on January 1, 2011. Summarize the data in tabular form, using the following column headings:

	Total	Preferred Dividends		Common Dividends	
Year	Dividends	Total	Per Share	Total	Per Share
2011	\$ 24,000				
2012	10,000				
2013	126,000				
2014	100,000				
2015	125,000				
2016	125,000				

(Continued)

✓ 1. Common dividends in 2013: \$25,000





**General Ledger** 

- 2. Determine the average annual dividend per share for each class of stock for the sixyear period.
- 3. Assuming a market price of \$100 for the preferred stock and \$5 for the common stock, calculate the average annual percentage return on initial shareholders' investment, based on the average annual dividend per share (a) for preferred stock and (b) for common stock.

#### PR 11-2B Stock transaction for corporate expansion

OBJ. 2

Pulsar Optics produces medical lasers for use in hospitals. The accounts and their balances appear in the ledger of Pulsar Optics on April 30 of the current year as follows:

Preferred 1% Stock, \$120 par (300,000 shares authorized,	
36,000 shares issued)	\$ 4,320,000
Paid-In Capital in Excess of Par—Preferred Stock	180,000
Common Stock, \$15 par (2,000,000 shares authorized,	
1,400,000 shares issued)	21,000,000
Paid-In Capital in Excess of Par—Common Stock	3,500,000
Retained Earnings	78,000,000

At the annual stockholders' meeting on August 5, the board of directors presented a plan for modernizing and expanding plant operations at a cost of approximately \$9,000,000. The plan provided (a) that the corporation borrow \$1,500,000, (b) that 20,000 shares of the unissued preferred stock be issued through an underwriter, and (c) that a building, valued at \$4,150,000, and the land on which it is located, valued at \$800,000, be acquired in accordance with preliminary negotiations by the issuance of 300,000 shares of common stock. The plan was approved by the stockholders and accomplished by the following transactions:

- Oct. 9. Borrowed \$1,500,000 from St. Peter City Bank, giving a 4% mortgage note.
  - 17. Issued 20,000 shares of preferred stock, receiving \$126 per share in cash.
  - 28. Issued 300,000 shares of common stock in exchange for land and a building, according to the plan.

#### **Instructions**

Journalize the entries to record the October transactions.

#### PR 11-3B Selected stock transactions

OBJ. 2, 3, 4

Diamondback Welding & Fabrication Corporation sells and services pipe welding equipment in Illinois. The following selected accounts appear in the ledger of Diamondback Welding & Fabrication Corporation at the beginning of the current fiscal year:

Preferred 2% Stock, \$80 par (100,000 shares authorized, 60,000 shares issued)	\$ 4,800,000
Paid-In Capital in Excess of Par—Preferred Stock	
Common Stock, \$9 par (3,000,000 shares authorized,	
1,750,000 shares issued)	15,750,000
Paid-In Capital in Excess of Par—Common Stock	1,400,000
Retained Earnings	52,840,000

During the year, the corporation completed a number of transactions affecting the stockholders' equity. They are summarized as follows:

- a. Purchased 87,500 shares of treasury common for \$8 per share.
- b. Sold 55,000 shares of treasury common for \$11 per share.
- c. Issued 20,000 shares of preferred 2% stock at \$84.
- d. Issued 400,000 shares of common stock at \$13, receiving cash.

✓ f. Cash dividends,

General Ledger

\$234,775



- e. Sold 18,000 shares of treasury common for \$7.50 per share.
- f. Declared cash dividends of \$1.60 per share on preferred stock and \$0.05 per share on common stock.
- g. Paid the cash dividends.

#### **Instructions**

Journalize the entries to record the transactions. Identify each entry by letter.

#### PR 11-4B Entries for selected corporate transactions

OBJ. 2, 3, 4, 5

Nav-Go Enterprises Inc. produces aeronautical navigation equipment. The stockholders' equity accounts of Nav-Go Enterprises Inc., with balances on January 1, 2016, are as follows:

Common Stock, \$5 stated value (900,000 shares authorized,

620,000 shares issued)	\$3,100,000
Paid-In Capital in Excess of Stated Value—Common Stock	1,240,000
Retained Earnings	4,875,000
Treasury Stock (48,000 shares, at cost)	288,000

The following selected transactions occurred during the year:

- Jan. 15. Paid cash dividends of \$0.06 per share on the common stock. The dividend had been properly recorded when declared on December 1 of the preceding fiscal year for \$34,320.
- Mar. 15. Sold all of the treasury stock for \$6.75 per share.
- Apr. 13. Issued 200,000 shares of common stock for \$8 per share.
- June 14. Declared a 3% stock dividend on common stock, to be capitalized at the market price of the stock, which is \$7.50 per share.
- July 16. Issued the certificates for the dividend declared on June 14.
- Oct. 30. Purchased 50,000 shares of treasury stock for \$6 per share.
- Dec. 30. Declared a \$0.08-per-share dividend on common stock.
  - 31. Closed the credit balance of the income summary account, \$775,000.
  - 31. Closed the two dividends accounts to Retained Earnings.

#### **Instructions**

- 1. Enter the January 1 balances in T accounts for the stockholders' equity accounts listed. Also prepare T accounts for the following: Paid-In Capital from Sale of Treasury Stock; Stock Dividends Distributable; Stock Dividends; Cash Dividends.
- 2. Journalize the entries to record the transactions, and post to the eight selected accounts.
- 3. Prepare a retained earnings statement for the year ended December 31, 2016.
- 4. Prepare the Stockholders' Equity section of the December 31, 2016, balance sheet.

#### PR 11-5B Entries for selected corporate transactions

OBJ. 2, 3, 4, 6

West Yellowstone Outfitters Corporation manufactures and distributes leisure clothing. Selected transactions completed by West Yellowstone Outfitters during the current fiscal year are as follows:

(Continued)

√ 4. Total stockholders' equity, \$11,262,432



General Ledger

✓ Sept. 1, Cash dividends, \$95,200

General Ledger

- Jan. 15. Split the common stock 4 for 1 and reduced the par from \$120 to \$30 per share. After the split, there were 800,000 common shares outstanding.
- Mar. 1. Declared semiannual dividends of \$0.25 on 100,000 shares of preferred stock and \$0.07 on the 800,000 shares of \$30 par common stock to stockholders of record on March 31, payable on April 30.
- Apr. 30. Paid the cash dividends.
- May 31. Purchased 60,000 shares of the corporation's own common stock at \$32, recording the stock at cost.
- Aug. 17. Sold 40,000 shares of treasury stock at \$38, receiving cash.
- Sept. 1. Declared semiannual dividends of \$0.25 on the preferred stock and \$0.09 on the common stock (before the stock dividend). In addition, a 1% common stock dividend was declared on the common stock outstanding, to be capitalized at the fair market value of the common stock, which is estimated at \$40.
- Oct. 31. Paid the cash dividends and issued the certificates for the common stock dividend.

#### **Instructions**

Journalize the transactions.

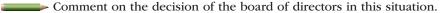
# **Cases & Projects**





#### CP 11-1 Board of directors' actions

Bernie Ebbers, the CEO of WorldCom, a major telecommunications company, was having personal financial troubles. Ebbers pledged a large stake of his WorldCom stock as security for some personal loans. As the price of WorldCom stock sank, Ebbers' bankers threatened to sell his stock in order to protect their loans. To avoid having his stock sold, Ebbers asked the board of directors of WorldCom to loan him nearly \$400 million of corporate assets at 2.5% interest to pay off his bankers. The board agreed to lend him the money.





#### CP 11-2 Ethics and professional conduct in business

Lou Hoskins and Shirley Crothers are organizing Red Lodge Metals Unlimited Inc. to undertake a high-risk gold-mining venture in Canada. Lou and Shirley tentatively plan to request authorization for 400,000,000 shares of common stock to be sold to the general public. Lou and Shirley have decided to establish par of \$0.03 per share in order to appeal to a wide variety of potential investors. Lou and Shirley feel that investors would be more willing to invest in the company if they received a large quantity of shares for what might appear to be a "bargain" price.

Discuss whether Lou and Shirley are behaving in a professional manner.

#### CP 11-3 Issuing stock

Epstein Engineering Inc. began operations on January 5, 2016, with the issuance of 500,000 shares of \$80 par common stock. The sole stockholders of Epstein Engineering Inc. are Barb Abrams and Dr. Amber Epstein, who organized Epstein Engineering Inc.

with the objective of developing a new flu vaccine. Dr. Epstein claims that the flu vaccine, which is nearing the final development stage, will protect individuals against 90% of the flu types that have been medically identified. To complete the project, Epstein Engineering Inc. needs \$25,000,000 of additional funds. The local banks have been unwilling to loan the funds because of the lack of sufficient collateral and the riskiness of the business.

The following is a conversation between Barb Abrams, the chief executive officer of Epstein Engineering Inc., and Amber Epstein, the leading researcher:

Barb: What are we going to do? The banks won't loan us any more money, and we've got to have \$25 million to complete the project. We are so close! It would be a disaster to quit now. The only thing I can think of is to issue additional stock. Do you have any suggestions?

Amber: I guess you're right. But if the banks won't loan us any more money, how do you think we can find any investors to buy stock?

*Barb*: I've been thinking about that. What if we promise the investors that we will pay them 5% of sales until they have received an amount equal to what they paid for the stock?

Amber: What happens when we pay back the \$25 million? Do the investors get to keep the stock? If they do, it'll dilute our ownership.

Barb: How about, if after we pay back the \$25 million, we make them turn in their stock for \$120 per share? That's one and one-half times what they paid for it, plus they would have already gotten all their money back. That's a \$120 profit per share for the investors.

Amber: It could work. We get our money, but don't have to pay any interest, dividends, or the \$80 per share until we start generating sales. At the same time, the investors could get their money back plus \$120 per share profit.

Barb: We'll need current financial statements for the new investors. I'll get our accountant working on them and contact our attorney to draw up a legally binding contract for the new investors. Yes, this could work.

In late 2016, the attorney and the various regulatory authorities approved the new stock offering, and 312,500 shares of common stock were privately sold to new investors at the stock's par of \$80.

In preparing financial statements for 2016, Barb Abrams and Dan Fisher, the controller for Epstein Engineering Inc., have the following conversation:

Dan: Barb, I've got a problem.

Barb: What's that, Dan?

Dan: Issuing common stock to raise that additional \$25 million was a great idea. But . . .

Barb: But what?

Dan: I've got to prepare the 2016 annual financial statements, and I am not sure how to classify the common stock.

Barb: What do you mean? It's common stock.

Dan: I'm not so sure. I called the auditor and explained how we are contractually obligated to pay the new stock-holders 5% of sales until \$80 per share is paid. Then, we may be obligated to pay them \$120 per share.

Barb: So ...

Dan: So the auditor thinks that we should classify the additional issuance of \$25 million as debt, not stock! And, if we put the \$25 million on the balance sheet as debt, we will violate our other loan agreements with the banks. And, if these agreements are violated, the banks may call in all our debt immediately. If they do that, we are in deep trouble. We'll probably have to file for bankruptcy. We just don't have the cash to pay off the banks.

- 1. Discuss the arguments for and against classifying the issuance of the \$25 million of stock as debt.
- 2. What do you think might be a practical solution to this classification problem?

#### CP 11-4 Interpret stock exchange listing





The following stock exchange data for Microsoft Corporation were taken from the Yahoo! Finance Web site on November 29, 2013:

Microsoft Corpor	ration (MSFT)		
Last Trade:	38.13	Prev. Clos:	37.60
Trade Time:	1:00 PM EST	1y Target Est:	36.32
		Day's Range:	37.82-38.29
		52wk Range:	26.26-38.29
		Volume:	22,090,428
		Div & Yield	1 12 (3 00%)

- a. If you owned 500 shares of Mircosoft, what amount would you receive as a quarterly dividend?
- b. Compute the percentage increase in price from the Previous Close to the Last Trade. Round to two decimal places.
- c. What is Microsoft's percentage change in market price from the 52-week low to the Last Trade on November 29, 2013? Round to one decimal place.
- d. If you bought 500 shares of Microsoft at the Last Trade price on November 29, 2013, how much would it cost, and who gets the money?

#### CP 11-5 Dividends

Motion Designs Inc. has paid quarterly cash dividends since 2005. These dividends have steadily increased from \$0.05 per share to the latest dividend declaration of \$0.50 per share. The board of directors would like to continue this trend and is hesitant to suspend or decrease the amount of quarterly dividends. Unfortunately, sales dropped sharply in the fourth quarter of 2016 because of worsening economic conditions and increased competition. As a result, the board is uncertain as to whether it should declare a dividend for the last quarter of 2016.

On October 1, 2016, Motion Designs Inc. borrowed \$4,000,000 from Valley National Bank to use in modernizing its retail stores and to expand its product line in reaction to its competition. The terms of the 10-year, 6% loan require Motion Designs Inc. to:

- a. Pay monthly interest on the last day of the month.
- b. Pay \$400,000 of the principal each October 1, beginning in 2017.
- c. Maintain a current ratio (current assets ÷ current liabilities) of 2.
- d. Maintain a minimum balance (a compensating balance) of \$100,000 in its Valley National Bank account.

On December 31, 2016, \$1,000,000 of the \$4,000,000 loan had been disbursed in modernization of the retail stores and in expansion of the product line. Motion Designs Inc.'s balance sheet as of December 31, 2016, follows:

#### Motion Designs Inc. Balance Sheet December 31, 2016

I, 2016		
;		
	\$ 250,000	
	3,000,000	
\$ 800,000		
50,000	750,000	
	2,980,000	
	20,000	
		\$ 7,000,000
	\$1,500,000	
\$5,050,000		
1,140,000	3,910,000	
\$3,320,000		
730,000	2,590,000	
		8,000,000
		\$15,000,000
<b>e</b> s		
\$ 1,590,000		
· ·		
	\$2.000.000	
	,_,,	
	3.600.000	
		\$ 5,600,000
		+ 3/000/000
'Equity		
÷ 4500.000		
270,000	¢ 4 770 000	
	4,630,000	0.400.000
		9,400,000
		\$15,000,000
	\$ 800,000 50,000 \$5,050,000 1,140,000 \$3,320,000	\$ 250,000 3,000,000 \$ 800,000 50,000 2,980,000 20,000 \$1,500,000 1,140,000 \$3,320,000 730,000 2,590,000 400,000 10,000 \$2,000,000 3,600,000

The board of directors is scheduled to meet January 10, 2017, to discuss the results of operations for 2016 and to consider the declaration of dividends for the fourth quarter of 2016. The chairman of the board has asked for your advice on the declaration of dividends.

- 1. What factors should the board consider in deciding whether to declare a cash dividend?
- 2. The board is considering the declaration of a stock dividend instead of a cash dividend. Discuss the issuance of a stock dividend from the point of view of (a) a stockholder and (b) the board of directors.

#### CP 11-6 Profiling a corporation

#### **Group Project**

**Internet Project** 

Select a public corporation you are familiar with or which interests you. Using the Internet, develop a short (1 to 2 pages) profile of the corporation. Include in your profile the following information:

- 1. Name of the corporation.
- 2. State of incorporation.
- 3. Nature of its operations.
- 4. Total assets for the most recent balance sheet.
- 5. Total revenues for the most recent income statement.
- 6. Net income for the most recent income statement.
- 7. Classes of stock outstanding.
- 8. Market price of the stock outstanding.
- 9. High and low price of the stock for the past year.
- 10. Cash dividends paid for each share of stock during the past year.

In groups of three or four, discuss each corporate profile. Select one of the corporations, assuming that your group has \$100,000 to invest in its stock. Summarize why your group selected the corporation it did and how financial accounting information may have affected your decision. Keep track of the performance of your corporation's stock for the remainder of the term.

*Note:* Most major corporations maintain "home pages" on the Internet. This home page provides a variety of information on the corporation and often includes the corporation's financial statements. In addition, the New York Stock Exchange Web site (www.nyse.com) includes links to the home pages of many listed companies that can be assessed by clicking on "Listings Directory." Financial statements can also be accessed using EDGAR, the electronic archives of financial statements filed with the Securities and Exchange Commission (SEC).

SEC documents can also be retrieved using the EdgarScan™ service at www.sec .gov/edgar/searchedgar/companysearch.html. To obtain annual report information, key in a company name in the appropriate space. Edgar will list the reports available to you for the company you've selected. Select the most recent annual report filing, identified as a 10-K or 10-K405.



# Long-Term Liabilities: Bonds and Notes

# Dick's Sporting Goods

ost of us don't have enough money in our bank accounts to buy a house or a car by simply writing a check. Just imagine if you had to save the entire purchase price of a house before you could buy it! To help us make these types of purchases, banks will typically lend us the money, as long as we agree to repay the loan with interest in smaller future payments. Loans such as this, or long-term debt, allow us to purchase assets such as houses and cars today, which benefit us over the long term.

The use of debt can also help a business reach its objectives. Most businesses have to borrow money in order to acquire assets that they will use to generate income. For example, in

1948 Dick Stack borrowed \$300 from his grandmother to start a sporting goods store in Binghamton, New York. Over the years the business grew, and in the early 1990s, **Dick's Sporting Goods** used long-term debt to transform itself from a small business to a Fortune 500 company with more than 450 stores across the United States.

While debt can help companies like Dick's Sporting Goods grow to achieve financial success, too much debt can be a financial burden that may even lead to bankruptcy. Just like individuals, businesses must manage debt wisely. In this chapter, we will discuss the nature of, accounting for, and analysis of, long-term debt.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Compute the potential impact of long-term borrowing on earnings per share. Financing Corporations	EE 12-1
Describe the characteristics and terminology of bonds payable. Nature of Bonds Payable Bond Characteristics and Terminology Proceeds from Issuing Bonds	
Journalize entries for bonds payable. Accounting for Bonds Payable Bonds Issued at Face Amount Bonds Issued at a Discount Amortizing a Bond Discount Bonds Issued at a Premium Amortizing a Bond Premium Bond Redemption	EE 12-2 EE 12-3 EE 12-4 EE 12-5 EE 12-6 EE 12-7
Describe and illustrate the accounting for installment notes. Installment Notes Issuing an Installment Note Annual Payments	<b>EE</b> 12-8
Describe and illustrate the reporting of long-term liabilities, including bonds and notes payable.  Reporting Long-Term Liabilities	
Describe and illustrate how the number of times interest charges are earned is used to evaluate a company's financial condition.  Financial Analysis and Interpretation: Number of Times Interest Charges Are Earned	EE 12-9
At a Glo	I <b>nce 12</b> Page 566



# **Financing Corporations**

Corporations finance their operations using the following sources:

- Short-term debt, such as purchasing goods or services on account.
- Long-term debt, such as issuing bonds or notes payable.
- Equity, such as issuing common or preferred stock.

Short-term debt, including the purchase of goods and services on account and the issuance of short-term notes payable, was discussed in Chapter 10. Issuing equity in the form of common or preferred stock was discussed in Chapter 11. This chapter focuses on the use of long-term debt such as bonds and notes payable to finance a company's operations.

A **bond** is a form of an interest-bearing note. Like a note, a bond requires periodic interest payments, with the face amount to be repaid at the maturity date. For example, a 12% bond requires the company issuing the bond to pay 12% interest on the face amount of the bonds every year. As creditors of the corporation, bondholder claims on the corporation's assets rank ahead of stockholders.

One of the main factors that influences the decision to issue debt or equity is the effect that various financing alternatives will have on earnings per share. **Earnings per share (EPS)** measures the income earned by each share of common stock. It is computed as follows:¹

¹ Earnings per share is also discussed in the Financial Analysis and Interpretation section of Chapter 11 and in Chapter 15.

To illustrate the effects that issuing debt can have on earnings per share, consider the following alternative plans for financing Boz Corporation, a \$4,000,000 company:

	Plan 1		1 Plan 2		Plar	1 3
	Amount	Percent	Amount	Percent	Amount	Percent
Issue 12% bonds	_	0%	_	0%	\$2,000,000	50%
Issue preferred 9% stock, \$50 par value	_	0	\$2,000,000	50	1,000,000	25
lssue common stock, \$10 par value	\$4,000,000	100	2,000,000	50	1,000,000	25
Total amount of financing	\$4,000,000	100%	\$4,000,000	100%	\$4,000,000	100%

The company must choose one of these plans. Each plan finances some of the corporation's operations by issuing common stock. However, the percentage financed by common stock varies from 100% (Plan 1) to 25% (Plan 3).

Assume the following data for Boz Corporation:

- Earnings before interest and income taxes are \$800,000.
- The tax rate is 40%.
- All bonds or stocks are issued at their par or face amount.

The effect of the preceding financing plans on Boz's net income and earnings per share is shown in Exhibit 1.

	Plan 1	Plan 2	Plan 3
12% bonds	_	_	\$2,000,000
Preferred 9% stock, \$50 par	_	\$2,000,000	1,000,000
Common stock, \$10 par	\$4,000,000	2,000,000	1,000,000
Total	\$4,000,000	\$4,000,000	\$4,000,000
Earnings before interest and income tax	\$ 800,000	\$ 800,000	\$ 800,000
Deduct interest on bonds			240,000ª
Income before income tax	\$ 800,000	\$ 800,000	\$ 560,000
Deduct income tax	320,000 ^b	320,000 ^b	224,000 ^b
Net income	\$ 480,000	\$ 480,000	\$ 336,000
Dividends on preferred stock		180,000 ^c	90,000°
Available for dividends on common stock	\$ 480,000	\$ 300,000	\$ 246,000
Shares of common stock outstanding	÷ 400,000 ^d	÷ 200,000 ^d	÷ 100,000d
Earnings per share on common stock	\$ 1.20	\$ 1.50	\$ 2.46
^a \$2,000,000 bonds × 12%			
Income before income tax $ imes$ 40%			
F Preferred stock × 9% F Common stock ÷ \$10 par value per share			

#### **EXHIBIT 1**

Effect of Alternative Financing Plans— \$800,000 Earnings



Exhibit 1 indicates that when earnings are strong, Plan 3 has the highest earnings per share, making it the most attractive for common shareholders. This is because the company is generating more than enough net income to cover the bond interest. If the estimated earnings are more than \$800,000, the difference between the earnings per share to common stockholders under Plans 1 and 3 is even greater.²

Lower earnings, however, have the opposite effect. If earnings are reduced to \$440,000, as illustrated in Exhibit 2, Plans 1 and 2 become more attractive to common stockholders. This is because more of the company's earnings are being used to pay bond interest, leaving less net income attributable to common stockholders.

²The higher earnings per share under Plan 3 is due to a finance concept known as *leverage*. This concept is discussed further in Chapter 15.

#### **EXHIBIT 2**

Effect of Alternative Financing Plans— \$440,000 Earnings



	Plan 1	Plan 2	Plan 3
12% bonds	_	_	\$2,000,000
Preferred 9% stock, \$50 par	_	\$2,000,000	1,000,000
Common stock, \$10 par	\$4,000,000	2,000,000	1,000,000
Total	\$4,000,000	\$4,000,000	\$4,000,000
Earnings before interest and income tax	\$ 440,000	\$ 440,000	\$ 440,000
Deduct interest on bonds			240,000
Income before income tax	\$ 440,000	\$ 440,000	\$ 200,000
Deduct income tax	176,000	176,000	80,000
Net income	\$ 264,000	\$ 264,000	\$ 120,000
Dividends on preferred stock		180,000	90,000
Available for dividends on common stock	\$ 264,000	\$ 84,000	\$ 30,000
Shares of common stock outstanding	÷ 400,000	÷ 200,000	÷ 100,000
Earnings per share on common stock	\$ 0.66	\$ 0.42	\$ 0.30

In addition to earnings per share, the corporation should consider other factors in deciding among the financing plans. For example, if bonds are issued, the interest and the face value of the bonds at maturity must be paid. If these payments are not made, the bondholders could seek court action and force the company into bankruptcy. In contrast, a corporation is not legally obligated to pay dividends on preferred or common stock.

# Example Exercise 12-1 Alternative Financing Plans



Gonzales Co. is considering the following alternative plans for financing its company:

	Plan 1	Plan 2
Issue 10% bonds (at face value)	_	\$2,000,000
Issue common stock, \$10 par	\$3,000,000	1,000,000

Income tax is estimated at 40% of income.

Determine the earnings per share of common stock under the two alternative financing plans, assuming income before bond interest and income tax is \$750,000.

#### Follow My Example 12-1

	Plan 1	Plan 2
Earnings before bond interest and income tax	\$750,000	\$750,000
Deduct interest on bonds	0	200,000 ²
Income before income tax	\$750,000	\$550,000
Deduct income tax	300,000 ¹	220,000 ³
Net income	\$450,000	\$330,000
Dividends on preferred stock	0	0
Available for dividends on common stock	\$450,000	\$330,000
Shares of common stock outstanding	÷300,000	÷100,000
Earnings per share on common stock	\$ 1.50	\$ 3.30
1\$750,000 × 40% 2\$2,000,000 × 10% 3\$550,000 × 40%		

Practice Exercises: PE 12-1A, PE 12-1B



# **Nature of Bonds Payable**

Corporate bonds normally differ in face amount, interest rates, interest payment dates, and maturity dates. Bonds also differ in other ways such as whether corporate assets are pledged in support of the bonds.

# **Bond Characteristics and Terminology**

A bond issue is normally divided into a number of individual bonds. The face amount of each bond is called the *principal*. This is the amount that must be repaid on the dates the bonds mature. The principal is usually \$1,000, or a multiple of \$1,000. The interest on bonds may be payable annually, semiannually, or quarterly. Most bonds pay interest semiannually.

The underlying contract between the company issuing bonds and the bondholders is called a **bond indenture**. This contract can be written in different ways, depending on the financing needs of the company. The two most common types of bonds are term bonds and serial bonds. When all bonds of an issue mature at the same time, they are called *term bonds*. If the bonds mature over several dates, they are called *serial bonds*. For example, one-tenth of an issue of \$1,000,000 bonds, or \$100,000, may mature 16 years from the issue date, another \$100,000 in the 17th year, and so on.

There are also a variety of more complicated bond structures. For example, *convertible bonds* may be exchanged for shares of common stock, and *callable bonds* may be redeemed by the corporation prior to maturity. These bonds are discussed in intermediate and advanced accounting texts.

# **Proceeds from Issuing Bonds**

When a corporation issues bonds, the proceeds received for the bonds depend on:

- The face amount of the bonds, which is the amount due at the maturity date.
- The interest rate on the bonds.
- The market rate of interest for similar bonds.

The face amount and the interest rate on the bonds are identified in the bond indenture. The interest rate to be paid on the face amount of the bond is called the **contract rate** or *coupon rate*.

The market rate of interest, sometimes called the effective rate of interest, is the rate determined from sales and purchases of similar bonds. The market rate of interest is affected by a variety of factors, including investors' expectations of current and future economic conditions.

By comparing the market and contract rates of interest, it can be determined whether the bonds will sell for more than, less than, or at their face amount, as shown in Exhibit 3.



If the market rate equals the contract rate, bonds will sell at the face amount.

If the market rate is greater than the contract rate, the bonds will sell for less than their face value. The face amount of the bonds less the selling price is called a **discount**. A bond sells at a discount because buyers are not willing to pay the full face amount for bonds with a contract rate that is lower than the market rate.



If the market rate is less than the contract rate, the bonds will sell for more than their face value. The selling price of the bonds less the face amount is called a premium. A bond sells at a premium because buyers are willing to pay more than the face amount for bonds with a contract rate that is higher than the market rate.

The price of a bond is quoted as a percentage of the bond's face value. For example, a \$1,000 bond quoted at 98 could be purchased or sold for \$980 ( $$1,000 \times 0.98$ ). Likewise, bonds quoted at 109 could be purchased or sold for \$1,090 ( $\$1,000 \times 1.09$ ).



# Business **Connection**

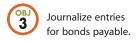
#### **U.S. GOVERNMENT DEBT**

Like many corporations, the U.S. government issues debt to finance its operations. The debt is issued by the U.S. Treasury Department in the form of U.S. Treasury bills, notes, and bonds, which have the following characteristics:

	Issued at	Interest Paid	Maturity
U.S. Treasury bills	Discount	None	1 year or less
U.S. Treasury notes	Face value	Semiannual	1 to 10 years
U.S. Treasury bonds	Face value	Semiannual	10 years or more

At the end of 2013, total U.S. government debt issued by the federal government was estimated to be \$17,548 billion. The Congressional Budget Office estimated that this amount would grow to \$21,325 billion by 2017.

Source: Historical Tables: Budget of the U.S. Government, Fiscal Year 2013, U.S. Office of Management and Budget.



# **Accounting for Bonds Payable**

Bonds may be issued at their face amount, a discount, or a premium. When bonds are issued at less or more than their face amount, the discount or premium must be amortized over the life of the bonds. At the maturity date, the face amount must be repaid. In some situations, a corporation may redeem bonds before their maturity date by repurchasing them from investors.

#### **Bonds Issued at Face Amount**

If the market rate of interest is equal to the contract rate of interest, the bonds will sell for their face amount or at a price of 100. To illustrate, assume that on January 1, 2015, Eastern Montana Communications Inc. issued the following bonds:

Face amount	\$100,000
Contract rate of interest	12%
Interest paid semiannually on	
June 30 and December 31.	
Term of bonds	5 years
Market rate of interest	12%

Since the contract rate of interest and the market rate of interest are the same, the bonds will sell at their face amount. The entry to record the issuance of the bonds is as follows:

²⁰¹⁵ Jan.
----------------------

Every six months (on June 30 and December 31) after the bonds are issued, interest of 6,000 ( $100,000 \times 12\% \times \frac{1}{2}$  year) is paid. The first interest payment on June 30, 2015, is recorded as follows:

	June 3	Orange 10 Interest Expense Cash Paid six months' interest on bonds.	6,000	6,000		
--	--------	---------------------------------------------------------------------	-------	-------	--	--

At the maturity date, the payment of the principal of \$100,000 is recorded as follows:

²⁰¹⁹ Dec.	31	Bonds Payable Cash Paid bond principal at maturity date.		100,000	100,000	
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# Example Exercise 12-2 Issuing Bonds at Face Amount



On January 1, the first day of the fiscal year, a company issues a \$1,000,000, 6%, five-year bond that pays semiannual interest of \$30,000 (\$1,000,000  $\times$  6%  $\times$  ½ year), receiving cash of \$1,000,000. Journalize the entries to record (a) the issuance of the bonds at their face amount, (b) the first interest payment on June 30, and (c) the payment of the principal on the maturity date.

#### 

#### **Bonds Issued at a Discount**

If the market rate of interest is greater than the contract rate of interest, the bonds will sell for less than their face amount. This is because investors are not willing to pay the full face amount for bonds that pay a lower contract rate of interest than the rate they could earn on similar bonds (market rate). The difference between the face amount and the selling price of the bonds is the bond discount.³

To illustrate, assume that on January 1, 2015, Western Wyoming Distribution Inc. issued the following bonds:

Face amount	\$100,000
Contract rate of interest	12%
Interest paid semiannually on	
June 30 and December 31.	
Term of bonds	5 years
Market rate of interest	13%

³ The price that investors are willing to pay for the bonds depends on present value concepts. Present value concepts, including the computation of bond prices, are described and illustrated in Appendix 1 at the end of this chapter.

#### Note:

Practice Exercises: PE 12-2A, PE 12-2B

Bonds will sell at a discount when the market rate of interest is higher than the contract rate. Because the contract rate of interest is less than the market rate of interest, the bonds will sell at less than their face amount. Assuming the bonds sell for \$96,406, the entry to record the issuance of the bonds is as follows:

²⁰¹⁵ Jan.	1	Cash Discount on Bonds Payable Bonds Payable Issued \$100,000 bonds at discount.	96,406 3,594	100,000	

The \$96,406 is the amount investors are willing to pay for bonds that have a lower contract rate of interest (12%) than the market rate (13%). The discount is the market's way of adjusting the contract rate of interest to the higher market rate of interest.

The account, Discount on Bonds Payable, is a contra account to Bonds Payable and has a normal debit balance. It is subtracted from Bonds Payable to determine the carrying amount (or book value) of the bonds payable. The **carrying amount** of bonds payable is the face amount of the bonds less any unamortized discount or plus any unamortized premium. Thus, after the preceding entry, the carrying amount of the bonds payable is \$96,406 (\$100,000 - \$3,594).

#### Example Exercise 12-3 Issuing Bonds at a Discount



On the first day of the fiscal year, a company issues a \$1,000,000, 6%, five-year bond that pays semiannual interest of \$30,000 (\$1,000,000  $\times$  6%  $\times$  ½), receiving cash of \$936,420. Journalize the entry to record the issuance of the bonds.

# Follow My Example 12-3

Cash	936.420		
	,		
Discount on Bonds Payable	63,580		
Bonds Payable		1,000,000	

Practice Exercises: PE 12-3A, PE 12-3B

# **Amortizing a Bond Discount**

Every period, a portion of the bond discount must be reduced and added to interest expense to reflect the passage of time. This process, called **amortization**, increases the contract rate of interest on a bond to the market rate of interest that existed on the date the bonds were issued. The entry to amortize a bond discount is as follows:

Г					
		Interest Expense	XXX		
		Discount on Bonds Payable		XXX	

The preceding entry may be made annually as an adjusting entry, or it may be combined with the semiannual interest payment. In the latter case, the entry would be as follows:

Internet Function	VVV		
Interest Expense	XXX		
Discount on Bonds Payable		XXX	
Cash (amount of semiannual interest)		XXX	

The two methods of computing the amortization of a bond discount are:

- Straight-line method
- Effective interest rate method, sometimes called the interest method

The effective interest rate method is required by generally accepted accounting principles. However, the straight-line method may be used if the results do not

differ significantly from the interest method. The straight-line method is used in this chapter. The effective interest rate method is described and illustrated in Appendix 2 at the end of this chapter.

The straight-line method provides equal amounts of amortization each period. To illustrate, amortization of the Western Wyoming Distribution bond discount of \$3,594 is computed as follows:

Discount on bonds payable \$3,594
Term of bonds 5 years

The combined entry to record the first interest payment and the amortization of the discount is as follows:

June 30 Interest Expense Discount on Bonds Payable Cash Paid semiannual interest and amortized 1/10 of bond discount.	6,359.40	359.40 6,000.00	
-----------------------------------------------------------------------------------------------------------------------	----------	--------------------	--

The preceding entry is made on each interest payment date. Thus, the amount of the semiannual interest expense on the bonds (\$6,359.40) remains the same over the life of the bonds.

The effect of the discount amortization is to increase the interest expense from \$6,000.00 to \$6,359.40 on every semiannual interest payment date. In effect, this increases the contract rate of interest from 12% to a rate of interest that approximates the market rate of 13%. In addition, as the discount is amortized, the carrying amount of the bonds increases until it equals the face amount of the bonds on the maturity date.

# **Example Exercise 12-4** Discount Amortization

(OB.)

Using the bond from Example Exercise 12-3, journalize the first interest payment and the amortization of the related bond discount.

# Follow My Example 12-4

Interest Expense 36,358

Discount on Bonds Payable 6,358

Cash 30,000

Paid interest and amortized the bond discount ( $$63,580 \div 10$ ).

Practice Exercises: PE 12-4A, PE 12-4B

#### **Bonds Issued at a Premium**

If the market rate of interest is less than the contract rate of interest, the bonds will sell for more than their face amount. This is because investors are willing to pay more for bonds that pay a higher contract rate of interest than the rate they could earn on similar bonds (market rate).

To illustrate, assume that on January 1, 2015, Northern Idaho Transportation Inc. issued the following bonds:

Face amount	\$100,000
Contract rate of interest	12%
Interest paid semiannually on	
June 30 and December 31.	
Term of bonds	5 years
Market rate of interest	11%

#### Note:

Bonds will sell at a premium when the market rate of interest is less than the contract rate.

Because the contract rate of interest is more than the market rate of interest, the bonds will sell for more than their face amount. Assuming the bonds sell for \$103,769, the entry to record the issuance of the bonds is as follows:

²⁰¹⁵ Jan.	1	Cash Bonds Payable	103,769	100,000	
		Premium on Bonds Payable		3,769	
		Issued \$100,000 bonds at a premium.			

The \$3,769 premium is the extra amount investors are willing to pay for bonds that have a higher contract rate of interest (12%) than the market rate (11%). The premium is the market's way of adjusting the contract rate of interest to the lower market rate of interest.

The account, Premium on Bonds Payable, has a normal credit balance. It is added to Bonds Payable to determine the carrying amount (or book value) of the bonds payable. Thus, after the preceding entry, the carrying amount of the bonds payable is \$103,769 (\$100,000 + \$3,769).

#### Example Exercise 12-5 Issuing Bonds at a Premium



On the first day of the fiscal year, a company issues a \$2,000,000, 12%, five-year bond that pays semiannual interest of \$120,000 (\$2,000,000  $\times$  12%  $\times$  ½), receiving cash of \$2,154,440. Journalize the bond issuance.

#### Follow My Example 12-5

 Cash
 2,154,440

 Premium on Bonds Payable
 154,440

 Bonds Payable
 2,000,000

Practice Exercises: PE 12-5A, PE 12-5B

# **Amortizing a Bond Premium**

Like bond discounts, a bond premium must be amortized over the life of the bond. The amortization of a bond premium decreases the contract rate of interest on a bond to the market rate of interest that existed on the date the bonds were issued. The amortization can be computed using either the straight-line or the effective interest rate method. The entry to amortize a bond premium is as follows:

	F	Premium on Bonds Payable Interest Expense		XXX	XXX		
--	---	----------------------------------------------	--	-----	-----	--	--

The preceding entry may be made annually as an adjusting entry, or it may be combined with the semiannual interest payment. In the latter case, it would be:

Interest Expense	XXX		
Premium on Bonds Payable	XXX		
Cash (amount of semiannual interest)		XXX	

To illustrate, amortization of the preceding premium of \$3,769 is computed as follows using the straight-line method:

> Premium on bonds payable..... \$3,769 Term of bonds..... 5 years

\$376.90 (\$3,769 ÷ 10 periods)

The combined entry to record the first interest payment and the amortization of the premium is as follows:

June 30 Interest Expense Premium on Bonds Payable Cash Paid semiannual int amortized 1/10 of bot	erest and	,623.10 376.90 6,000.00
--------------------------------------------------------------------------------------------------	-----------	-------------------------------

The preceding entry is made on each interest payment date. Thus, the amount of the semiannual interest expense (\$5,623.10) on the bonds remains the same over the life of the bonds.

The effect of the premium amortization is to decrease the interest expense from \$6,000.00 to \$5,623.10. In effect, this decreases the rate of interest from 12% to a rate of interest that approximates the market rate of 11%. In addition, as the premium is amortized, the carrying amount of the bonds decreases until it equals the face amount of bonds on the maturity date.

#### Example Exercise 12-6 Premium Amortization



Using the bond from Example Exercise 12-5, journalize the first interest payment and the amortization of the related bond premium.

# Follow My Example 12-6

Interest Expense ...... 104,556 Premium on Bonds Payable ..... 15,444 Cash.....

Paid interest and amortized the bond premium ( $$154,440 \div 10$ ).

120,000

Practice Exercises: PE 12-6A, PE 12-6B



# Business Connection

#### **BOND RATINGS**

When purchasing bonds, investors are very interested in understanding how likely it is that the bond issuer will be able to repay the bond principal and associated interest. To help them assess this likelihood, independent rating agencies review and grade the financial condition of companies that issue bonds. For example, the Standard & Poor's rating agency rates bonds on a scale from D (lowest) to AAA (highest). Bonds with a rating of BBB- or higher are called investment

grade because they are issued by companies in sound financial condition and are considered to be reasonably safe investments. Bonds issued by companies in relatively weak financial condition receive ratings below BBB-, reflecting the higher potential for default or nonpayment. These lesser quality bonds are referred to as non-investment grade or junk bonds. The market rate of interest on junk bonds is much higher than the market rate on investment grade bonds, which compensates bond investors for junk bonds' higher risk of default.

# **Bond Redemption**

A corporation may redeem or call bonds before they mature. This is often done when the market rate of interest declines below the contract rate of interest. In such cases, the corporation may issue new bonds at a lower interest rate and use the proceeds to redeem the original bond issue.

Callable bonds can be redeemed by the issuing corporation within the period of time and at the price stated in the bond indenture. Normally, the call price is above the face value. A corporation may also redeem its bonds by purchasing them on the open market.⁴

A corporation usually redeems its bonds at a price different from the carrying amount (or book value) of the bonds. A gain or loss may be realized on a bond redemption as follows:

- A gain is recorded if the price paid for redemption is below the bond carrying amount.
- A loss is recorded if the price paid for the redemption is above the carrying amount.

Gains and losses on the redemption of bonds are reported in the *Other income* (*loss*) section of the income statement.

To illustrate, assume that on June 30, 2015, a corporation has the following bond issue:

Face amount of bonds \$100,000 Premium on bonds payable 4,000

On June 30, 2015, the corporation redeemed one-fourth (\$25,000) of these bonds in the market for \$24,000. The entry to record the redemption is as follows:

June	30 Bonds Payable Premium on Bonds Payable Cash Gain on Redemption of Bonds Redeemed \$25,000 bonds for \$24,000.	25,000 1,000	24,000 2,000	
------	------------------------------------------------------------------------------------------------------------------	-----------------	-----------------	--

In the preceding entry, only the portion of the premium related to the redeemed bonds ( $\$4,000 \times 25\% = \$1,000$ ) is written off. The difference between the carrying amount of the bonds redeemed, \$26,000 (\$25,000 + \$1,000), and the redemption price, \$24,000, is recorded as a gain.

Assume that the corporation calls the remaining \$75,000 of outstanding bonds, which are held by a private investor, for \$79,500 on July 1, 2015. The entry to record the redemption is as follows:

July
------

# Example Exercise 12-7 Redemption of Bonds Payable



A \$500,000 bond issue on which there is an unamortized discount of \$40,000 is redeemed for \$475,000. Journalize the redemption of the bonds.

(Continued)

⁴ Some bond indentures require the corporation issuing the bonds to transfer cash to a special cash fund, called a *sinking fund*, over the life of the bond. Such funds help assure investors that there will be adequate cash to pay the bonds at their maturity date.

Follow My Example 12-7	
Bonds Payable	500,000
Loss on Redemption of Bonds	15,000
Discount on Bonds Payable	40,000
Cash	475,000
Practic	e Exercises: PE 12-7A, PE 12-7B

# **Installment Notes**

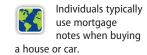
Corporations often finance their operations by issuing bonds payable. As an alternative, corporations may issue a different kind of notes payable called installment notes. An **installment note** is a debt that requires the borrower to make equal periodic payments to the lender for the term of the note. Unlike bonds, each note payment includes the following:



- Payment of a portion of the amount initially borrowed, called the *principal*
- · Payment of interest on the outstanding balance

At the end of the note's term, the principal will have been repaid in full.

Installment notes are often used to purchase specific assets such as equipment, and are often secured by the purchased asset. When a note is secured by an asset, it is called a **mortgage note**. If the borrower fails to pay a mortgage note, the lender has the right to take possession of the pledged asset and sell it to pay off the debt. Mortgage notes are typically issued by an individual bank.



#### **Issuing an Installment Note**

When an installment note is issued, an entry is recorded debiting Cash and crediting Notes Payable. To illustrate, assume that Lewis Company issues the following installment note to City National Bank on January 1, 2015:

Principal amount of note	\$24,000
Interest rate	6%
Term of note	5 years
Annual payments	\$5,698⁵

The entry to record the issuance of the note is as follows:

	²⁰¹⁵ Jan.	1	Cash Notes Payable Issued installment note for cash.		24,000	24,000	
--	----------------------	---	------------------------------------------------------------	--	--------	--------	--

# **Annual Payments**

The preceding note payable requires Lewis Company to repay the principal and interest in equal payments of \$5,698 beginning December 31, 2015, for each of the next five years. Unlike bonds, however, each installment note payment includes an interest and principal component.

The interest portion of an installment note payment is computed by multiplying the interest rate by the carrying amount (book value) of the note at the beginning of the period. The principal portion of the payment is then computed as the difference between the total installment note payment (cash paid) and the interest component. These computations are illustrated in Exhibit 4 (rounded to the nearest dollar).

⁵The amount of the annual payment is calculated by using the present value concepts discussed in Appendix 1 at the end of this chapter. The annual payment of \$5,698 is computed by dividing the \$24,000 loan amount by the present value of an annuity of \$1 for five periods at 6% (4.21236) from Exhibit 10 (rounded to the nearest dollar).

#### **EXHIBIT 4**

#### **Amortization of Installment Notes**

	Α	В	С	D Decrease	E December 31
For the Year Ending	January 1 Carrying Amount	Note Payment (cash paid)	Interest Expense (6% of January 1 Note Carrying Amount)	in Notes Payable (B – C)	Carrying Amount (A – D)
December 31, 2015	\$24,000	\$ 5,698	\$ 1,440 (6% of \$24,000)	\$ 4,258	\$19,742
December 31, 2016	19,742	5,698	1,185 (6% of \$19,742)	4,513	15,229
December 31, 2017	15,229	5,698	914 (6% of \$15,229)	4,784	10,445
December 31, 2018	10,445	5,698	627 (6% of \$10,445)	5,071	5,374
December 31, 2019	5,374	5,698	324* (6% of \$5,374)	5,374	0
		\$28,490	\$4,490	\$24,000	
*Rounded (\$5,374 – \$5,698).			<del></del>		

- 1. The January 1, 2015, carrying value (Column A) equals the amount borrowed from the bank. The January 1 balance in the following years equals the December 31 balance from the prior year.
- 2. The note payment (Column B) remains constant at \$5,698, the annual cash payment required by the bank.
- 3. The interest expense (Column C) is computed at 6% of the installment note carrying amount at the beginning of each year. As a result, the interest expense decreases each year.
- 4. Notes payable decreases each year by the amount of the principal repayment (Column D). The principal repayment is computed by subtracting the interest expense (Column C) from the total payment (Column B). The principal repayment (Column D) increases each year as the interest expense decreases (Column C).
- 5. The carrying amount on December 31 (Column E) of the note decreases from \$24,000, the initial amount borrowed, to \$0 at the end of the five years.

The entry to record the first payment on December 31, 2015, is as follows:

	Dec. 31	Interest Expense Notes Payable Cash Paid principal and interest on installment note.		1,440 4,258	5,698	
--	---------	--------------------------------------------------------------------------------------	--	----------------	-------	--

The entry to record the second payment on December 31, 2016, is as follows:

	²⁰¹⁶ Dec. 31	Interest Expense Notes Payable Cash Paid principal and interest on installment note.		1,185 4,513	5,698	
--	-------------------------	--------------------------------------------------------------------------------------	--	----------------	-------	--

As the prior entries show, the cash payment is the same in each year. The interest and principal repayment, however, change each year. This is because the carrying amount (book value) of the note decreases each year as principal is repaid, which decreases the interest component the next period.

The entry to record the final payment on December 31, 2019, is as follows:

²⁰¹⁹ Dec.	31	Interest Expense Notes Payable Cash Paid principal and interest on installment note.		324 5,374	5,698	
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After the final payment, the carrying amount on the note is zero, indicating that the note has been paid in full. Any assets that secure the note would then be released by the bank.

#### Example Exercise 12-8 Journalizing Installment Notes





On the first day of the fiscal year, a company issues a \$30,000, 10%, five-year installment note that has annual payments of \$7,914. The first note payment consists of \$3,000 of interest and \$4,914 of principal repayment.

- a. Journalize the entry to record the issuance of the installment note.
- b. Journalize the first annual note payment.

#### Follow My Example 12-8

30,000
7,914

Practice Exercises: PE 12-8A, PE 12-8B

# Integrity, Objectivity, and Ethics in Business



#### THE RATINGS GAME

In February 2013, the United States Justice Department filed a lawsuit against the three main credit rating agencies (Moody's, Standard & Poor's, and Fitch) for inflating their ratings on highly risk bond issuances between 2004 and 2007. During this time period, the three ratings agencies gave their highest rating (AAA) to debt securities that were, in fact, highly risky. During the financial crisis of 2008, most of these bonds experienced significant

drops in value, leaving investors with huge losses. The Justice Department lawsuit alleges that the ratings agencies were aware of the high risks associated with these bonds but inflated their ratings because of the large fee they received for providing a rating on these bonds. At the time of this writing, the lawsuit was pending.

Source: "U.S. vs. S&P: The Rating Game," *The Chicago Tribune,* February 6, 2013

# **Reporting Long-Term Liabilities**

Bonds payable and notes payable are reported as liabilities on the balance sheet. Any portion of the bonds or notes that is due within one year is reported as a current liability. Any remaining bonds or notes are reported as a long-term liability.

Any unamortized premium is reported as an addition to the face amount of the bonds. Any unamortized discount is reported as a deduction from the face amount of the bonds. A description of the bonds and notes should also be reported either on the face of the financial statements or in the accompanying notes.



The reporting of bonds and notes payable for Mornin' Joe follows:



#### Mornin' Joe Balance Sheet December 31, 2016

Current liabilities:		
Accounts payable	\$133,000	
Notes payable (current portion)	200,000	
Salaries and wages payable	42,000	
Payroll taxes payable	16,400	
Interest payable	40,000	
Total current liabilities		\$ 431,400
Long-term liabilities:		
Bonds payable, 8%, due December 31, 2030	\$500,000	
Less unamortized discount	16,000	\$ 484,000
Notes payable		1,400,000
Total long-term liabilities		\$1,884,000
Total liabilities		\$2,315,400

# Describe and illustrate how the number of times interest charges are earned is used to evaluate a company's financial condition.



# Financial Analysis and Interpretation: Number of Times Interest Charges Are Earned

As we have discussed, the assets of a company are subject to the (1) claims of creditors and (2) the rights of owners. As creditors, bondholders are primarily concerned with the company's ability to make its periodic interest payments and repay the face amount of the bonds at maturity.

Analysts assess the risk that bondholders will not receive their interest payments by computing the **number of times interest charges are earned** during the year as follows:

$$Number of Times Interest Charges Are Earned = \frac{Income Before Income Tax + Interest Expense}{Interest Expense}$$

This ratio computes the number of times interest payments could be paid out of current period earnings, measuring the company's ability to make its interest payments. Because interest payments reduce income tax expense, the ratio is computed using income before tax.

To illustrate, the following data were taken from a recent annual report of The Coca-Cola Company (in thousands):

Interest expense \$ 733,000 Income before income tax 14,243,000

The number of times interest charges are earned for The Coca-Cola Company is computed as follows:

Number of Times Interest Charges Are Earned = 
$$\frac{\$14,243,000 + \$733,000}{\$733,000} = 20.43$$

Compare this to the number of times interest charges are earned for United Continental Holdings (an airline), and Verizon Communications (a telecommunications company) which follow (in thousands):

		United	Verizon
	Coca-Cola	Continental	Communications
Interest expense	\$733,000	\$783,000	\$2,523,000
Income before income tax expense	\$14,243,000	\$250,000	\$12,684,000
Number of times interest charges are earned	20.43	1.32	6.03

Coca-Cola's number of times interest charges are earned is 20.43, indicating that the company generates enough income before taxes to pay (cover) its interest payments 20.43 times. As a result, debtholders have extremely good protection in the event of an earnings decline. Compare this to United Continental, which only generates enough income before taxes to pay (cover) its interest payments 1.32 times. A small decrease in United Continental's earnings could jeopardize the payment of interest. Verizon Communications falls in between, with a ratio of 6.03.

# Example Exercise 12-9 Number of Times Interest Charges Are Earned



Harris Industries reported the following on the company's income statement in 2016 and 2015:

	2016	2015
Interest expense	\$ 200,000	\$180,000
Income before income tax expense	1,000,000	720,000

- a. Determine the number of times interest charges were earned for 2016 and 2015.
- b. Is the number of times interest charges are earned improving or declining?

#### Follow My Example 12-9

a. 2016:

Number of times interest charges are earned: 
$$\frac{\$1,000,000 + \$200,000}{\$200,000} = 6.0$$

2015:

Number of times interest charges are earned: 
$$\frac{\$720,000 + \$180,000}{\$180,000} = 5.0$$

b. The number of times interest charges are earned has increased from 5.0 in 2015 to 6.0 in 2016. Thus, the debtholders have improved confidence in the company's ability to make its interest payments.

Practice Exercises: PE 12-9A, PE 12-9B

# A P P E N D I X 1

# Present Value Concepts and Pricing Bonds Payable

When a corporation issues bonds, the price that investors are willing to pay for the bonds depends on the following:

- The face amount of the bonds, which is the amount due at the maturity date.
- The periodic interest to be paid on the bonds.
- The market rate of interest.

An investor determines how much to pay for the bonds by computing the present value of the bond's future cash receipts, using the market rate of interest. A bond's future cash receipts include its face value at maturity and the periodic interest payments.

## **Present Value Concepts**

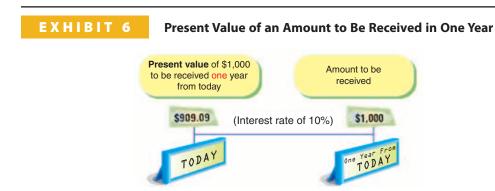
The concept of present value is based on the time value of money. The *time value* of money concept recognizes that cash received today is worth more than the same amount of cash to be received in the future.

To illustrate, what would you rather have: \$1,000 today or \$1,000 one year from now? You would rather have the \$1,000 today because it could be invested to earn interest. For example, if the \$1,000 could be invested to earn 10% per year, the \$1,000 will accumulate to \$1,100 (\$1,000 plus \$100 interest) in one year. In this sense, you can think of the \$1,000 in hand today as the **present value** of \$1,100 to be received a year from today. This present value is illustrated in Exhibit 5.

# Present Value and Future Value Present value of \$1,100 to be received one year from today (Interest rate of 10%) \$1,000 | Tuture value of \$1,000 received one year ago \$1,000 | Tuture value of \$1,000 received one year ago | Tuture value of \$1,000 received one year ago | Tuture value of \$1,000 received one year ago

A related concept to present value is **future value**. To illustrate, using the preceding example illustrated in Exhibit 5, the \$1,100 to be received on December 31, 2015, is the *future value* of \$1,000 on January 1, 2015, assuming an interest rate of 10%.

**Present Value of an Amount** To illustrate the present value of an amount, assume that \$1,000 is to be received in one year. If the market rate of interest is 10%, the present value of the \$1,000 is \$909.09 ( $$1,000 \div 1.10$ ). This present value is illustrated in Exhibit 6.

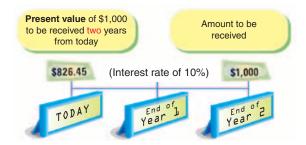


If the \$1,000 is to be received in two years, with interest of 10% compounded at the end of the first year, the present value is  $$826.45 ($909.09 \div 1.10)$ . This present value is illustrated in Exhibit 7.

 $^{^6}$  Note that the future value of \$826.45 in two years, at an interest rate of 10% compounded annually, is \$1,000.

#### **EXHIBIT 7**

#### Present Value of an Amount to Be Received in Two Years



The present value of an amount to be received in the future can be determined by a series of divisions as illustrated in Exhibits 5, 6, and 7. In practice, however, it is easier to use a table of present values.

The *present value of \$1* table is used to find the present value factor for \$1 to be received after a number of periods in the future. The amount to be received is then multiplied by this factor to determine its present value.

To illustrate, Exhibit 8 is a partial table of the present value of \$1.7 Exhibit 8 indicates that the present value of \$1 to be received in two years with a market rate of interest of 10% a year is 0.82645. Multiplying \$1,000 to be received in two years by 0.82645 yields \$826.45 (\$1,000 × 0.82645). This amount is the same amount computed earlier. In Exhibit 8, the Periods column represents the number of compounding periods, and the percentage columns represent the compound interest rate per period. Thus, the present value factor from Exhibit 8 for 12% for five years is 0.56743. If the interest is compounded semiannually, the interest rate is 6% ( $12\% \div 2$ ), and the number of periods is 10 (5 years × 2 times per year). Thus, the present value factor from Exhibit 8 for 6% and 10 periods is 0.55839.



Spreadsheet software and business calculators

have built-in present value functions that can also be used to calculate present values.

#### EXHIBIT 8

#### **Present Value of \$1 at Compound Interest**

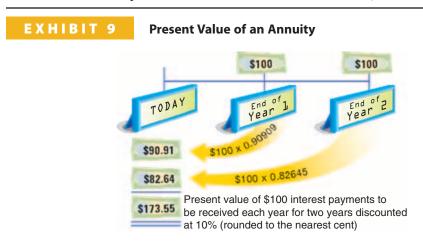
Periods	4%	41/2%	5%	51/2%	6%	61/2%	<b>7</b> %	10%	11%	12%	13%
1	0.96154	0.956940	0.95238	0.94787	0.94340	0.93897	0.93458	0.90909	0.90090	0.89286	0.88496
2	0.92456	0.915730	0.90703	0.89845	0.89000	0.88166	0.87344	0.82645	0.81162	0.79719	0.78315
3	0.88900	0.876300	0.86384	0.85161	0.83962	0.82785	0.81630	0.75131	0.73119	0.71178	0.69305
4	0.85480	0.838560	0.82270	0.80722	0.79209	0.77732	0.76290	0.68301	0.65873	0.63552	0.61332
5	0.82193	0.802450	0.78353	0.76513	0.74726	0.72988	0.71299	0.62092	0.59345	0.56743	0.54276
6	0.79031	0.767900	0.74622	0.72525	0.70496	0.68533	0.66634	0.56447	0.53464	0.50663	0.48032
7	0.75992	0.734830	0.71068	0.68744	0.66506	0.64351	0.62275	0.51316	0.48166	0.45235	0.42506
8	0.73069	0.703190	0.67684	0.65160	0.62741	0.60423	0.58201	0.46651	0.43393	0.40388	0.37616
9	0.70259	0.672900	0.64461	0.61763	0.59190	0.56735	0.54393	0.42410	0.39092	0.36061	0.33288
10	0.67556	0.643930	0.61391	0.58543	0.55839	0.53273	0.50835	0.38554	0.35218	0.32197	0.29459

Some additional examples using Exhibit 8 follow:

	Number of Periods	Interest Rate	Present Value of \$1 Factor from Exhibit 8
10% for two years compounded annually	2	10%	0.82645
10% for two years compounded semiannually	4	5%	0.82270
10% for three years compounded semiannually	6	5%	0.74622
12% for five years compounded semiannually	10	6%	0.55839

⁷To simplify the illustrations and homework assignments, the tables presented in this chapter are limited to 10 periods for a small number of interest rates, and the amounts are carried to only five decimal places. Computer programs and business function calculators can be used to determine present values for any number of interest rates, decimal places, or periods. More complete interest tables are presented in Appendix A of the text.

**Present Value of the Periodic Receipts** A series of equal cash receipts spaced equally in time is called an **annuity**. The **present value of an annuity** is the sum of the present values of each cash receipt. To illustrate, assume that \$100 is to be received annually for two years and that the market rate of interest is 10%. Using Exhibit 8, the present value of the receipt of the two amounts of \$100 is \$173.55, as shown in Exhibit 9.



Instead of using present value of \$1 tables to determine the present value of each cash flow separately, such as in Exhibit 8, the present value of an annuity can be computed in a single step. Using a value from the *present value of an annuity of \$1* table in Exhibit 10, the present value of the entire annuity can be calculated by multiplying the equal cash payment times the appropriate present value of an annuity of \$1.

## **EXHIBIT 10** Present Value of an Annuity of \$1 at Compound Interest

Periods	4%	41/2%	5%	51/2%	6%	61/2%	<b>7</b> %	10%	11%	12%	13%
1	0.96154	0.95694	0.95238	0.94787	0.94340	0.93897	0.93458	0.90909	0.90090	0.89286	0.88496
2	1.88609	1.87267	1.85941	1.84632	1.83339	1.82063	1.80802	1.73554	1.71252	1.69005	1.66810
3	2.77509	2.74896	2.72325	2.69793	2.67301	2.64848	2.62432	2.48685	2.44371	2.40183	2.36115
4	3.62990	3.58753	3.54595	3.50515	3.46511	3.42580	3.38721	3.16987	3.10245	3.03735	2.97447
5	4.45182	4.38998	4.32948	4.27028	4.21236	4.15568	4.10020	3.79079	3.69590	3.60478	3.51723
6	5.24214	5.15787	5.07569	4.99553	4.91732	4.84101	4.76654	4.35526	4.23054	4.11141	3.99755
7	6.00205	5.89270	5.78637	5.68297	5.58238	5.48452	5.38929	4.86842	4.71220	4.56376	4.42261
8	6.73274	6.59589	6.46321	6.33457	6.20979	6.08875	5.97130	5.33493	5.14612	4.96764	4.79677
9	7.43533	7.26879	7.10782	6.95220	6.80169	6.65610	6.51523	5.75902	5.53705	5.32825	5.13166
10	8.11090	7.91272	7.72173	7.53763	7.36009	7.18883	7.02358	6.14457	5.88923	5.65022	5.42624

To illustrate, the present value of \$100 to be received at the end of each of the next two years at 10% compound interest per period is \$173.55 ( $$100 \times 1.73554$ ). This amount is the same amount computed previously using the present value of \$1.

# **Pricing Bonds**

The selling price of a bond is the sum of the present values of:

- The face amount of the bonds due at the maturity date
- The periodic interest to be paid on the bonds

The market rate of interest is used to compute the present value of both the face amount and the periodic interest.

To illustrate the pricing of bonds, assume that Southern Utah Communications Inc. issued the following bond on January 1, 2015:

Face amount	\$100,000
Contract rate of interest	12%
Interest paid semiannually on June 30 and December 31.	
Term of honds	5 vears

**Market Rate of Interest of 12%** Assuming a market rate of interest of 12%, the bonds would sell for their face amount. As shown by the following present value computations, the bonds would sell for \$100,000:

Present value of face amount of \$100,000 due in five years,	
at 12% compounded semiannually: $$100,000 \times 0.55839$	
(present value of \$1 for 10 periods at 6% from Exhibit 8)	\$ 55,839
Present value of 10 semiannual interest payments of \$6,000,	
at 12% compounded semiannually: \$6,000 × 7.36009	
(present value of an annuity of \$1 for 10 periods at 6% from Exhibit 10)	44,161
Total present value of bonds	\$100,000

**Market Rate of Interest of 13%** Assuming a market rate of interest of 13%, the bonds would sell at a discount. As shown by the following present value computations, the bonds would sell for \$96,406:⁸

Present value of face amount of \$100,000 due in five years,	
at 13% compounded semiannually: \$100,000 × 0.53273	
(present value of \$1 for 10 periods at 61/2% from Exhibit 8)	\$53,273
Present value of 10 semiannual interest payments of \$6,000,	
at 13% compounded semiannually: \$6,000 × 7.18883	
(present value of an annuity of \$1 for 10 periods at 6½% from Exhibit 10)	43,133
Total present value of bonds	\$96,406

**Market Rate of Interest of 11%** Assuming a market rate of interest of 11%, the bonds would sell at a premium. As shown by the following present value computations, the bonds would sell for \$103,769:

```
Present value of face amount of $100,000 due in five years, at 11% compounded semiannually: $100,000 \times 0.58543 (present value of $1 for 10 periods at 5\frac{1}{2}% from Exhibit 8). $ 58,543 Present value of 10 semiannual interest payments of $6,000, at 11% compounded semiannually: $6,000 \times 7.53763 (present value of an annuity of $1 for 10 periods at 5\frac{1}{2}% from Exhibit 10). 45,226 Total present value of bonds. $103,769
```

As shown, the selling price of the bond varies with the present value of the bond's face amount at maturity, interest payments, and the market rate of interest.

# APPENDIX 2

# **Effective Interest Rate Method of Amortization**

The effective interest rate method of amortization provides for a constant *rate* of interest over the life of the bonds. As the discount or premium is amortized, the carrying amount of the bonds changes. As a result, interest expense also changes each period. This is in contrast to the straight-line method, which provides for a constant *amount* of interest expense each period.

⁸ Some corporations issue bonds called *zero-coupon bonds* that provide for only the payment of the face amount at maturity. Such bonds sell for large discounts. In this example, such a bond would sell for \$53,273, which is the present value of the face amount.

The interest rate used in the effective interest rate method of amortization, sometimes called the *interest method*, is the market rate on the date the bonds are issued. The carrying amount of the bonds is multiplied by this interest rate to determine the interest expense for the period. The difference between the interest expense and the interest payment is the amount of discount or premium to be amortized for the period.

# **Amortization of Discount by the Interest Method**

To illustrate, the following data taken from the chapter illustration of issuing bonds at a discount are used:

Face value of 12%, five-year bonds, interest compounded semiannually	\$1	00,000
Present value of bonds at effective (market) rate of interest of 13%		96,406
Discount on bonds payable	\$	3,594

Exhibit 11 illustrates the interest method for the preceding bonds. Exhibit 11 begins with six columns. The first column is not lettered. The remaining columns are lettered A through E. The exhibit was then prepared as follows:

- Step 1. List the interest payments dates in the first column, which for the preceding bond are 10 interest payment dates (semiannual interest over five years). Also, list on the first line the initial amount of discount in Column D and the initial carrying amount (selling price) of the bonds in Column E.
- Step 2. List in Column A the semiannual interest payments, which for the preceding bond are \$6,000 (\$100,000 × 6%).
- Step 3. Compute the interest expense in Column B by multiplying the bond carrying amount at the beginning of each period times 6½%, which is the semiannual effective interest (market) rate (13% ÷ 2).
- Step 4. In Column C, compute the discount to be amortized each period by subtracting the interest payment in Column A (\$6,000) from the interest expense for the period shown in Column B.
- Step 5. Compute the remaining unamortized discount by subtracting the amortized discount in Column C for the period from the unamortized discount at the beginning of the period in Column D.
- Step 6. Compute the bond carrying amount at the end of the period by subtracting the unamortized discount at the end of the period in Column D from the face amount of the bonds (\$100,000).

Steps 3–6 are repeated for each interest payment.

#### **EXHIBIT 11**

#### **Amortization of Discount on Bonds Payable**

Interest Payment	A Interest Paid (6% of Face	B Interest Expense (6½% of Bond	C Discount Amortization	D Unamortized Discount	E Bond Carrying Amount
Date	Amount)	Carrying Amount)	(B – A)	(D – C)	(\$100,000 – D)
	•		, , , , , , , , , , , , , , , , , , , ,	\$3,594	\$ 96,406
June 30, 2015	\$6,000	\$6,266 (6½% of \$96,406)	\$266	3,328	96,672
Dec. 31, 2015	6,000	6,284 (6½% of \$96,672)	284	3,044	96,956
June 30, 2016	6,000	6,302 (6½% of \$96,956)	302	2,742	97,258
Dec. 31, 2016	6,000	6,322 (6½% of \$97,258)	322	2,420	97,580
June 30, 2017	6,000	6,343 (6½% of \$97,580)	343	2,077	97,923
Dec. 31, 2017	6,000	6,365 (6½% of \$97,923)	365	1,712	98,288
June 30, 2018	6,000	6,389 (6½% of \$98,288)	389	1,323	98,677
Dec. 31, 2018	6,000	6,414 (6½% of \$98,677)	414	909	99,091
June 30, 2019	6,000	6,441 (6½% of \$99,091)	441	468	99,532
Dec. 31, 2019	6,000	6,470 (6½% of \$99,532)	468*	_	100,000
*Cannot exceed u	inamortized discount.				

As shown in Exhibit 11, the interest expense increases each period as the carrying amount of the bond increases. Also, the unamortized discount decreases each period to zero at the maturity date. Finally, the carrying amount of the bonds increases from \$96,406 to \$100,000 (the face amount) at maturity.

The entry to record the first interest payment on June 30, 2015, and the related discount amortization is as follows:

June 30 Interest Expense Discount on Bonds Payable Cash Paid semiannual interest and amortized bond discount for 1/2 year.	6,266	266 6,000	
----------------------------------------------------------------------------------------------------------------------------	-------	--------------	--

If the amortization is recorded only at the end of the year, the amount of the discount amortized on December 31, 2015, would be \$550. This is the sum of the first two semiannual amortization amounts (\$266 and \$284) from Exhibit 11.

# **Amortization of Premium by the Interest Method**

To illustrate, the following data taken from the chapter illustration of issuing bonds at a premium are used:

Present value of bonds at effective (market) rate of interest of 11%	\$103,7	769
Face value of 12%, five-year bonds, interest compounded semiannually	100,0	000
Premium on bonds payable	\$ 3,7	769

Exhibit 12 illustrates the interest method for the preceding bonds. Exhibit 12 begins with six columns. The first column is not lettered. The remaining columns are lettered A through E. The exhibit was then prepared as follows:

- Step 1. List the number of interest payments in the first column, which for the preceding bond are 10 interest payments (semiannual interest over five years). Also, list on the first line the initial amount of premium in Column D and the initial carrying amount of the bonds in Column E.
- Step 2. List in Column A the semiannual interest payments, which for the preceding bond are \$6,000 (\$100,000 × 6%).

#### EXHIBIT 12

#### **Amortization of Premium on Bonds Payable**

	Α	В	C	D	E
Interest	Interest Paid	Interest Expense	Premium	Unamortized	Bond Carrying
Payment	(6% of Face	(5½% of Bond	Amortization	Premium	Amount
Date	Amount)	Carrying Amount)	(A – B)	(D – C)	(\$100,000 + D)
				\$3,769	\$103,769
June 30, 2015	\$6,000	\$5,707 (5½% of \$103,769)	\$293	3,476	103,476
Dec. 31, 2015	6,000	5,691 (5½% of \$103,476)	309	3,167	103,167
June 30, 2016	6,000	5,674 (51/2% of \$103,167)	326	2,841	102,841
Dec. 31, 2016	6,000	5,656 (5½% of \$102,841)	344	2,497	102,497
June 30, 2017	6,000	5,637 (5½% of \$102,497)	363	2,134	102,134
Dec. 31, 2017	6,000	5,617 (51/2% of \$102,134)	383	1,751	101,751
June 30, 2018	6,000	5,596 (51/2% of \$101,751)	404	1,347	101,347
Dec. 31, 2018	6,000	5,574 (5½% of \$101,347)	426	921	100,921
June 30, 2019	6,000	5,551 (5½% of \$100,921)	449	472	100,472
Dec. 31, 2019	6,000	5,526 (5½% of \$100,472)	472*	_	100,000

- Step 3. Compute the interest expense in Column B by multiplying the bond carrying amount at the beginning of each period times 5½%, which is the semiannual effective interest (market) rate (11% ÷ 2).
- Step 4. In Column C, compute the premium to be amortized each period by subtracting the interest expense for the period shown in Column B from the interest payment in Column A (\$6,000).
- Step 5. Compute the remaining unamortized premium by subtracting the amortized premium in Column C for the period from the unamortized premium at the beginning of the period in Column D.
- Step 6. Compute the bond carrying amount at the end of the period by adding the unamortized premium at the end of the period in Column D to the face amount of the bonds (\$100,000).

Steps 3–6 are repeated for each interest payment.

As shown in Exhibit 12, the interest expense decreases each period as the carrying amount of the bond decreases. Also, the unamortized premium decreases each period to zero at the maturity date. Finally, the carrying amount of the bonds decreases from \$103,769 to \$100,000 (the face amount) at maturity.

The entry to record the first interest payment on June 30, 2015, and the related premium amortization is as follows:

2015					
June	30	Interest Expense	5,707		
		Premium on Bonds Payable	293		
		Cash		6,000	
		Paid semiannual interest and amortized			
		bond premium for 1/2 year.			

If the amortization is recorded only at the end of the year, the amount of the premium amortized on December 31, 2015, would be \$602. This is the sum of the first two semiannual amortization amounts (\$293 and \$309) from Exhibit 12.

# At a Glance 12



#### Compute the potential impact of long-term borrowing on earnings per share.

**Key Points** Corporations can finance their operations by issuing short-term debt, long-term debt, or equity. One of the many factors that influence a corporation's decision on whether it should issue long-term debt or equity is the effect each alternative has on earnings per share.

Learning Outcomes	Example Exercises	Practice Exercises
• Define the concept of a bond.		
• Calculate and compare the effect of alternative long-term financing plans on earnings per share.	EE12-1	PE12-1A, 12-1B



#### Describe the characteristics and terminology of bonds payable.

Key Points A corporation that issues bonds enters into a contract, or bond indenture.

When a corporation issues bonds, the price that buyers are willing to pay for the bonds depends on (1) the face amount of the bonds, (2) the periodic interest to be paid on the bonds, and (3) the market rate of interest.

Learning Outcomes	Example Exercises	Practice Exercises
• Define the characteristics of a bond.		
• Describe the various types of bonds.		
• Describe the factors that determine the price of a bond.		



#### Journalize entries for bonds payable.

**Key Points** The journal entry for issuing bonds payable debits Cash and credits Bonds Payable. Any difference between the face amount of the bonds and the selling price is debited to Discount on Bonds Payable or credited to Premium on Bonds Payable when the bonds are issued. The discount or premium on bonds payable is amortized to interest expense over the life of the bonds.

At the maturity date, the entry to record the repayment of the face value of a bond is a debit to Bonds Payable and a credit to Cash.

When a corporation redeems bonds before they mature, Bonds Payable is debited for the face amount of the bonds, the premium (discount) on bonds payable account is debited (credited) for its unamoritized balance, Cash is credited, and any gain or loss on the redemption is recorded.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Journalize the issuance of bonds at face value and the payment of periodic interest.</li> </ul>	EE12-2	PE12-2A, 12-2B
• Journalize the issuance of bonds at a discount.	EE12-3	PE12-3A, 12-3B
• Journalize the amortization of a bond discount.	EE12-4	PE12-4A, 12-4B
• Journalize the issuance of bonds at a premium.	EE12-5	PE12-5A, 12-5B
• Journalize the amortization of a bond premium.	EE12-6	PE12-6A, 12-6B
Describe bond redemptions.		
• Journalize the redemption of bonds payable	EE12-7	PE12-7A, 12-7B



#### Describe and illustrate the accounting for installment notes.

**Key Points** An installment note requires the borrower to make equal periodic payments to the lender for the term of the note. Unlike bonds, the annual payment in an installment note consists of both principal and interest. The journal entry for the annual payment debits Interest Expense and Notes Payable and credits Cash for the amount of the payment. After the final payment, the carrying amount on the note is zero.

Learning Outcomes	Example Exercises	Practice Exercises
• Define the characteristics of an installment note.		
• Journalize the issuance of installment notes.	EE12-8	PE12-8A, 12-8B
• Journalize the annual payment for an installment note.		



#### Describe and illustrate the reporting of long-term liabilities, including bonds and notes payable.

**Key Points** Bonds payable and notes payable are usually reported as long-term liabilities. If the balance sheet date is within one year, they are reported as current liabilities. A discount on bonds should be reported as a deduction from the related bonds payable. A premium on bonds should be reported as an addition to related bonds payable.

#### **Learning Outcome**

• Illustrate the balance sheet presentation of bonds payable and notes payable.

Example Exercises Practice Exercises



Describe and illustrate how the number of times interest charges are earned is used to evaluate a company's financial condition.

**Key Points** The number of times interest charges are earned measures the risk to bondholders that a company will not be able to make its interest payments. It is computed by dividing income before income tax plus interest expense by interest expense. This ratio measures the number of times interest payments could be paid (covered) by current period earnings.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe and compute the number of times interest charges are earned.	EE12-9	PE12-9A, 12-9B
• Interpret the number of times interest charges are earned.		

# **Key Terms**

amortization (550) annuity (562) bond (544) bond indenture (547) carrying amount (550) contract rate (547) discount (547) earnings per share (EPS) (544) effective interest rate method (550) effective rate of interest (547) face amount (547) future value (560) installment note (555)

market rate of interest (547) mortgage note (555) number of times interest charges are earned (558) premium (548) present value (560) present value of annuity (562)

# **Illustrative Problem**

The fiscal year of Russell Inc., a manufacturer of acoustical supplies, ends December 31. Selected transactions for the period 2015 through 2022, involving bonds payable issued by Russell Inc., are as follows:

2015

- June 30. Issued \$2,000,000 of 25-year, 7% callable bonds dated June 30, 2015, for cash of \$1,920,000. Interest is payable semiannually on June 30 and December 31.
- Dec. 31. Paid the semiannual interest on the bonds. The bond discount is amortized annually in a separate journal entry.
  - 31. Recorded straight-line amortization of \$1,600 of discount on the bonds.
  - 31. Closed the interest expense account.

2016

- June 30. Paid the semiannual interest on the bonds. The bond discount is amortized annually in a separate journal entry.
- Dec. 31. Paid the semiannual interest on the bonds. The bond discount is amortized annually in a separate journal entry.
  - 31. Recorded straight-line amortization of \$3,200 of discount on the bonds.
  - 31. Closed the interest expense account.

2022

June 30. Recorded the redemption of the bonds, which were called at 101.5. The balance in the bond discount account is \$57,600 after the payment of interest and amortization of discount have been recorded. (Record the redemption only.)

#### **Instructions**

- 1. Journalize entries to record the preceding transactions.
- 2. Determine the amount of interest expense for 2015 and 2016.
- 3. Determine the carrying amount of the bonds as of December 31, 2016.

#### Solution

1.

June	30	Cash Discount on Bonds Payable Bonds Payable	1,920,000 80,000	2,000,000	
Dec.	31	Interest Expense	70,000	2,000,000	
		Cash		70,000	
	31	Interest Expense Discount on Bonds Payable Amortization of discount from July 1 to December 31.	1,600	1,600	
	31	Income Summary Interest Expense	71,600	71,600	
June	30	Interest Expense Cash	70,000	70,000	
Dec.	31	Interest Expense Cash	70,000	70,000	
	31	Interest Expense Discount on Bonds Payable Amortization of discount from January 1 to December 31.	3,200	3,200	
	31	Income Summary Interest Expense	143,200	143,200	
June	30	Bonds Payable	2,000,000		
		Loss on Redemption of Bonds Payable Discount on Bonds Payable Cash	87,600	57,600 2,030,000	

- 2. a. 2015: \$71,600 = \$70,000 + \$1,600
  - b. 2016: \$143,200 = \$70,000 + \$70,000 + \$3,200
- 3. Initial carrying amount of bonds
  Discount amortized on December 31, 2015
  Discount amortized on December 31, 2016
  Carrying amount of bonds, December 31, 2016
  \$1,920,000

  \$1,600

  \$3,200

  \$1,924,800

# **Discussion Questions**

- Describe the two distinct obligations incurred by a corporation when issuing bonds.
- 2. Explain the meaning of each of the following terms as they relate to a bond issue: (a) convertible, and (b) callable.
- 3. If you asked your broker to purchase for you a 12% bond when the market interest rate for such bonds was 11%, would you expect to pay more or less than the face amount for the bond? Explain.
- 4. A corporation issues \$26,000,000 of 9% bonds to yield interest at the rate of 7%. (a) Was the amount of cash received from the sale of the bonds greater or less than \$26,000,000? (b) Identify the following amounts as they relate to the bond issue: (1) face amount, (2) market or effective rate of interest, (3) contract rate of interest, and (4) maturity amount.
- 5. If bonds issued by a corporation are sold at a discount, is the market rate of interest greater or less than the contract rate?
- 6. The following data relate to a \$2,000,000, 8% bond issued for a selected semiannual interest period:

Bond carrying amount at beginning of period	\$2,125,000
Interest paid during period	160,000
Interest expense allocable to the period	148,750

- (a) Were the bonds issued at a discount or at a premium? (b) What is the unamortized amount of the discount or premium account at the beginning of the period? (c) What account was debited to amortize the discount or premium?
- 7. Bonds Payable has a balance of \$5,000,000 and Discount on Bonds Payable has a balance of \$150,000. If the issuing corporation redeems the bonds at 98, is there a gain or loss on the bond redemption?
- 8. What is a mortgage note?
- 9. Fleeson Company needs additional funds to purchase equipment for a new production facility and is considering either issuing bonds payable or borrowing the money from a local bank in the form of an installment note. How does an installment note differ from a bond payable?
- 10. In what section of the balance sheet would a bond payable be reported if: (a) it is payable within one year and (b) it is payable beyond one year?

# **Practice Exercises**

**EE 12-1** p. 546

#### **PE 12-1A** Alternative financing plans

OBJ. 1

SHOW ME HOW Owen Co. is considering the following alternative financing plans:

 Plan 1
 Plan 2

 Issue 7% bonds (at face value)
 \$5,000,000
 \$3,400,000

 Issue preferred \$1 stock, \$20 par
 —
 3,600,000

 Issue common stock, \$25 par
 5,000,000
 3,000,000

Income tax is estimated at 40% of income.

Determine the earnings per share of common stock, assuming income before bond interest and income tax is \$750,000.

#### **EE 12-1** p. 546

#### PE 12-1B Alternative financing plans

OBJ. 1



Brower Co. is considering the following alternative financing plans:

	Plan 1	Plan 2
Issue 10% bonds (at face value)	\$4,000,000	\$2,500,000
Issue preferred \$2.50 stock, \$25 par	_	3,000,000
Issue common stock, \$10 par	4,000,000	2,500,000

Income tax is estimated at 40% of income.

Determine the earnings per share of common stock, assuming income before bond interest and income tax is \$2,000,000.

#### **EE 12-2** p. 549

#### PE 12-2A Issuing bonds at face amount

OBJ. 3



On January 1, the first day of the fiscal year, a company issues a \$500,000, 5%, 10-year bond that pays semiannual interest of \$12,500 ( $$500,000 \times 5\% \times \frac{1}{2}$  year), receiving cash of \$500,000. Journalize the entries to record (a) the issuance of the bonds, (b) the first interest payment on June 30, and (c) the payment of the principal on the maturity date.

#### **EE 12-2** p. 549

#### PE 12-2B Issuing bonds at face amount

OBJ. 3



On January 1, the first day of the fiscal year, a company issues a \$800,000, 4%, 10-year bond that pays semiannual interest of \$16,000 (\$800,000  $\times$  4%  $\times$  ½ year), receiving cash of \$800,000. Journalize the entries to record (a) the issuance of the bonds, (b) the first interest payment on June 30, and (c) the payment of the principal on the maturity date.

#### **EE 12-3** p. 550

#### PE 12-3A Issuing bonds at a discount

OBJ. 3



On the first day of the fiscal year, a company issues a \$1,200,000, 9%, five-year bond that pays semiannual interest of \$54,000 ( $$1,200,000 \times 9\% \times \frac{1}{2}$ ), receiving cash of \$1,153,670. Journalize the bond issuance.

#### **EE 12-3** *p. 550*

#### PE 12-3B Issuing bonds at a discount

OBJ. 3



On the first day of the fiscal year, a company issues a \$3,000,000, 11%, five-year bond that pays semiannual interest of \$165,000 ( $$3,000,000 \times 11\% \times \frac{1}{2}$ ), receiving cash of \$2,889,599. Journalize the bond issuance.

#### **EE 12-4** p. 551

#### PE 12-4A Discount amortization

OBJ. 3



Using the bond from Practice Exercise 12-3A, journalize the first interest payment and the amortization of the related bond discount. Round to the nearest dollar.

#### **EE 12-4** *p. 551*

#### PE 12-4B Discount amortization

OBJ. 3



Using the bond from Practice Exercise 12-3B, journalize the first interest payment and the amortization of the related bond discount. Round to the nearest dollar.

#### **EE 12-5** *p. 552*

#### PE 12-5A Issuing bonds at a premium

OBJ. 3



On the first day of the fiscal year, a company issues a \$2,000,000, 8%, five-year bond that pays semiannual interest of \$80,000 (\$2,000,000  $\times$  8%  $\times$  ½), receiving cash of \$2,170,604. Journalize the bond issuance.

#### **EE 12-5** *p. 552*

#### PE 12-5B Issuing bonds at a premium

OBJ. 3



On the first day of the fiscal year, a company issues an \$8,000,000, 11%, five-year bond that pays semiannual interest of \$440,000 (\$8,000,000  $\times$  11%  $\times$  ½), receiving cash of \$8,308,869. Journalize the bond issuance.

#### **EE 12-6** p. 553 **PE 12-6A Premium amortization**

OBJ. 3



Using the bond from Practice Exercise 12-5A, journalize the first interest payment and the amortization of the related bond premium. Round to the nearest dollar.

#### **EE 12-6** *p. 553*

#### PE 12-6B Premium amortization

OBJ. 3



Using the bond from Practice Exercise 12-5B, journalize the first interest payment and the amortization of the related bond premium. Round to the nearest dollar.

#### **EE 12-7** p. 554

#### PE 12-7A Redemption of bonds payable

OBJ. 3



A \$1,500,000 bond issue on which there is an unamortized discount of \$70,100 is redeemed for \$1,455,000. Journalize the redemption of the bonds.

#### **EE 12-7** p. 554

#### PE 12-7B Redemption of bonds payable

OBJ. 3



A \$500,000 bond issue on which there is an unamortized premium of \$67,000 is redeemed for \$490,000. Journalize the redemption of the bonds.

#### **EE 12-8** p. 557

#### PE 12-8A Journalizing installment notes

OBJ. 4



On the first day of the fiscal year, a company issues \$65,000, 6%, five-year installment notes that have annual payments of \$15,431. The first note payment consists of \$3,900 of interest and \$11,531 of principal repayment.

- a. Journalize the entry to record the issuance of the installment notes.
- b. Journalize the first annual note payment.

#### **EE 12-8** p. 557

#### PE 12-8B Journalizing installment notes

OBJ. 4

On the first day of the fiscal year, a company issues \$45,000, 8%, six-year installment notes that have annual payments of \$9,734. The first note payment consists of \$3,600 of interest and \$6,134 of principal repayment.

- a. Journalize the entry to record the issuance of the installment notes.
- b. Journalize the first annual note payment.

#### **EE 12-9** p. 559

#### PE 12-9A Number of times interest charges are earned

OBJ. 6



ME HOW



Berry Company reported the following on the company's income statement in 2016 and 2015:

	2016	2015
Interest expense	\$ 320,000	\$ 300,000
Income before income tax expense	3,200,000	3,600,000

- a. Determine the number of times interest charges are earned for 2016 and 2015. Round to one decimal place.
- b. Is the number of times interest charges are earned improving or declining?

#### **EE 12-9** p. 559

#### PE 12-9B Number of times interest charges are earned

OBJ. 6



Averill Products Inc. reported the following on the company's income statement in 2016 and 2015:

	2016	2015
Interest expense	\$ 440,000	\$ 400,000
Income before income tax expense	5,544,000	4,400,000

- a. Determine the number of times interest charges are earned for 2016 and 2015. Round to one decimal place.
- b. Is the number of times interest charges are earned improving or declining?

### **Exercises**

#### ✓ a. \$1.64











**✓** b. \$2,122,340



#### EX 12-1 Effect of financing on earnings per share

OBJ, 1

Domanico Co., which produces and sells biking equipment, is financed as follows:

Bonds payable, 8% (issued at face amount) \$10,000,000 Preferred \$5 stock, \$10 par 10,000,000 Common stock, \$20 par 10,000,000

Income tax is estimated at 40% of income.

Determine the earnings per share of common stock, assuming that the income before bond interest and income tax is (a) \$10,500,000, (b) \$11,800,000, and (c) \$13,000,000.

#### EX 12-2 Evaluate alternative financing plans

OBJ. 1

Based on the data in Exercise 12-1, what factors other than earnings per share should be considered in evaluating these alternative financing plans?

#### EX 12-3 Corporate financing

OBJ. 1

The financial statements for Nike, Inc., are presented in Appendix B at the end of the text. What is the major source of financing for Nike?

#### EX 12-4 Bond price

OBJ. 3

United States Steel's 7.375% bonds due in 2020 were reported as selling for 103.00.

Were the bonds selling at a premium or at a discount? Why is United States Steel able to sell its bonds at this price?

#### EX 12-5 Entries for issuing bonds

OBJ. 3

Gabriel Co. produces and distributes semiconductors for use by computer manufacturers. Gabriel Co. issued \$600,000 of 10-year, 8% bonds on May 1 of the current year at face value, with interest payable on May 1 and November 1. The fiscal year of the company is the calendar year. Journalize the entries to record the following selected transactions for the current year:

- May 1. Issued the bonds for cash at their face amount.
- Nov. 1. Paid the interest on the bonds.
- Dec. 31. Recorded accrued interest for two months.

#### EX 12-6 Entries for issuing bonds and amortizing discount by straight-line method OBJ. 2, 3

On the first day of its fiscal year, Pretender Company issued \$18,500,000 of five-year, 10% bonds to finance its operations of producing and selling home improvement products. Interest is payable semiannually. The bonds were issued at a market (effective) interest rate of 12%, resulting in Pretender Company receiving cash of \$17,138,298.

- a. Journalize the entries to record the following:
  - 1. Issuance of the bonds.
  - 2. First semiannual interest payment. The bond discount is combined with the semiannual interest payment. (Round your answer to the nearest dollar.)
  - 3. Second semiannual interest payment. The bond discount is combined with the semiannual interest payment. (Round your answer to the nearest dollar.)
- b. Determine the amount of the bond interest expense for the first year.
- c. Explain why the company was able to issue the bonds for only \$17,138,298 rather than for the face amount of \$18,500,000.





Lerner Corporation wholesales repair products to equipment manufacturers. On April 1, 2016, Lerner Corporation issued \$12,000,000 of five-year, 8% bonds at a market (effective) interest rate of 6%, receiving cash of \$13,023,576. Interest is payable semiannually on April 1 and October 1. Journalize the entries to record the following:

- a. Issuance of bonds on April 1, 2016.
- b. First interest payment on October 1, 2016, and amortization of bond premium for six months, using the straight-line method. (Round to the nearest dollar.)
- c. Explain why the company was able to issue the bonds for \$13,023,576 rather than for the face amount of \$12,000,000.



#### EX 12-8 Entries for issuing and calling bonds; loss

OBJ. 3

Adele Corp., a wholesaler of music equipment, issued \$22,000,000 of 20-year, 7% callable bonds on March 1, 2016 at their face amount, with interest payable on March 1 and September 1. The fiscal year of the company is the calendar year. Journalize the entries to record the following selected transactions:

2016

- Mar. 1. Issued the bonds for cash at their face amount.
- Sept.1. Paid the interest on the bonds.

2020

Sept.1. Called the bond issue at 102, the rate provided in the bond indenture. (Omit entry for payment of interest.)



#### EX 12-9 Entries for issuing and calling bonds; gain

OBJ. 3

Emil Corp. produces and sells wind-energy-driven engines. To finance its operations, Emil Corp. issued \$15,000,000 of 20-year, 9% callable bonds on May 1, 2016 at their face amount, with interest payable on May 1 and November 1. The fiscal year of the company is the calendar year. Journalize the entries to record the following selected transactions:

2016

- May 1. Issued the bonds for cash at their face amount.
- Nov. 1. Paid the interest on the bonds.

2022

Nov. 1. Called the bond issue at 96, the rate provided in the bond indenture. (Omit entry for payment of interest.)



#### **EX 12-10** Entries for installment note transactions

OBJ. 4

On the first day of the fiscal year, Shiller Company borrowed \$85,000 by giving a seven-year, 7% installment note to Soros Bank. The note requires annual payments of \$15,772, with the first payment occurring on the last day of the fiscal year. The first payment consists of interest of \$5,950 and principal repayment of \$9,822.

- a. Journalize the entries to record the following:
  - 1. Issued the installment note for cash on the first day of the fiscal year.
  - 2. Paid the first annual payment on the note.
- Explain how the notes payable would be reported on the balance sheet at the end of the first year.



#### **EX 12-11** Entries for installment note transactions

OBJ. 4

On January 1, 2016, Hebron Company issued a \$175,000, five-year, 8% installment note to Ventsam Bank. The note requires annual payments of \$43,380, beginning on December 31, 2016. Journalize the entries to record the following:

2016

- Jan. 1. Issued the note for cash at its face amount.
- Dec. 31. Paid the annual payment on the note, which consisted of interest of \$14,000 and principal of \$29,830.

2019

Dec. 31. Paid the annual payment on the note, included \$6,253 of interest. The remainder of the payment reduced the principal balance on the note.





#### **EX 12-12** Entries for installment note transactions

**OBJ. 4** 

On January 1, 2016, Bryson Company obtained a \$147,750, four-year, 7% installment note from Campbell Bank. The note requires annual payments of \$43,620, beginning on December 31, 2016.

- a. Prepare an amortization table for this installment note, similar to the one presented in Exhibit 4.
- b. Journalize the entries for the issuance of the note and the four annual note payments.
- c. Describe how the annual note payment would be reported in the 2016 income statement.

#### EX 12-13 Reporting bonds

OBJ. 5

At the beginning of the current year, two bond issues (Simmons Industries 7% 20-year bonds and Hunter Corporation 8% 10-year bonds) were outstanding. During the year, the Simmons Industries bonds were redeemed and a significant loss on the redemption of bonds was reported as an extraordinary item on the income statement. At the end of the year, the Hunter Corporation bonds were reported as a noncurrent liability. The maturity date on the Hunter Corporation bonds was early in the following year.

Identify the flaws in the reporting practices related to the two bond issues.





#### **EX 12-14** Number of times interest charges are earned

OBJ. 6

The following data were taken from recent annual reports of Southwest Airlines, which operates a low-fare airline service to more than 50 cities in the United States:

	Current Year	Preceding Year
Interest expense	\$147,000,000	\$194,000,000
Income before income tax	685,000,000	323,000,000

- a. Determine the number of times interest charges are earned for the current and preceding years. Round to one decimal place.
- b. What conclusions can you draw?

#### EX 12-15 Number of times interest charges are earned

ORI 6



Loomis, Inc. reported the following on the company's income statement in 2016 and 2015:

	2016	2015
Interest expense	\$ 13,500,000	\$ 16,000,000
Income before income tax expense	310,500,000	432,000,000

- a. Determine the number of times interest charges were earned for 2016 and 2015. Round to one decimal place.
- b. _____ Is the number of times interest charges are earned improving or declining?

F-A-I

#### \ \

#### EX 12-16 Number of times interest charges are earned

OBJ. 6

Iacouva Company reported the following on the company's income statement for 2016 and 2015:

	2016	2015
Interest expense	\$5,000,000	\$5,000,000
Income before income tax	3,500,000	6,000,000

- a. Determine the number of times interest charges are earned for 2016 and 2015. Round to one decimal place.
- b. What conclusions can you draw?

#### **Appendix 1**

#### EX 12-17 Present value of amounts due

Tommy John is going to receive \$1,000,000 in three years. The current market rate of interest is 10%.

- a. Using the present value of \$1 table in Exhibit 8, determine the present value of this amount compounded annually.
- b. Why is the present value less than the \$1,000,000 to be received in the future?

#### **Appendix 1**

#### EX 12-18 Present value of an annuity

Determine the present value of \$200,000 to be received at the end of each of four years, using an interest rate of 7%, compounded annually, as follows:

- a. By successive computations, using the present value table in Exhibit 8.
- b. By using the present value table in Exhibit 10.
- c. Why is the present value of the four \$200,000 cash receipts less than the \$800,000 to be received in the future?

#### Appendix 1

#### EX 12-19 Present value of an annuity

**✓** \$40,395,063

On January 1, 2016, you win \$50,000,000 in the state lottery. The \$50,000,000 prize will be paid in equal installments of \$6,250,000 over eight years. The payments will be made on December 31 of each year, beginning on December 31, 2016. If the current interest rate is 5%, determine the present value of your winnings. Use the present value tables in Appendix A.

#### **Appendix 1**

#### EX 12-20 Present value of an annuity

Assume the same data as in Exercise 12–19, except that the current interest rate is 12%. Will the present value of your winnings using an interest rate of 12% be more than the present value of your winnings using an interest rate of 5%? Why or why not?

#### **Appendix 1**

#### **EX 12-21** Present value of bonds payable; discount

Pinder Co. produces and sells high-quality video equipment. To finance its operations, Pinder Co. issued \$25,000,000 of five-year, 7% bonds, with interest payable semiannually, at a market (effective) interest rate of 9%. Determine the present value of the bonds payable, using the present value tables in Exhibits 8 and 10. Round to the nearest dollar.

#### Appendix 1

#### EX 12-22 Present value of bonds payable; premium

**✓** \$45,323,443

Moss Co. issued \$42,000,000 of five-year, 11% bonds, with interest payable semiannually, at a market (effective) interest rate of 9%. Determine the present value of the bonds payable using the present value tables in Exhibits 8 and 10. Round to the nearest dollar.

#### **Appendix 2**

#### EX 12-23 Amortize discount by interest method

✓ b. \$3,923,959

On the first day of its fiscal year, Ebert Company issued \$50,000,000 of 10-year, 7% bonds to finance its operations. Interest is payable semiannually. The bonds were issued at a market (effective) interest rate of 9%, resulting in Ebert Company receiving cash of \$43,495,895. The company uses the interest method.

- a. Journalize the entries to record the following:
  - 1. Sale of the bonds.
  - 2. First semiannual interest payment, including amortization of discount. Round to the nearest dollar.
  - Second semiannual interest payment, including amortization of discount. Round to the nearest dollar.
- b. Compute the amount of the bond interest expense for the first year.
- c. Explain why the company was able to issue the bonds for only \$43,495,895 rather than for the face amount of \$50,000,000.

#### **Appendix 2**

#### EX 12-24 Amortize premium by interest method

**✓** b. \$1,662,619

Shunda Corporation wholesales parts to appliance manufacturers. On January 1, 2016, Shunda Corporation issued \$22,000,000 of five-year, 9% bonds at a market (effective) interest rate of 7%, receiving cash of \$23,829,684. Interest is payable semiannually. Shunda Corporation's fiscal year begins on January 1. The company uses the interest method.

- a. Journalize the entries to record the following:
  - 1. Sale of the bonds.
  - 2. First semiannual interest payment, including amortization of premium. Round to the nearest dollar.
  - 3. Second semiannual interest payment, including amortization of premium. Round to the nearest dollar.
- b. Determine the bond interest expense for the first year.
- c. Explain why the company was able to issue the bonds for \$23,829,684 rather than for the face amount of \$22,000,000.

# Appendix 1 and Appendix 2

# EX 12-25 Compute bond proceeds, amortizing premium by interest method, and interest expense

✓ a. \$37,702,483✓ c. \$225,620

Ware Co. produces and sells motorcycle parts. On the first day of its fiscal year, Ware Co. issued \$35,000,000 of five-year, 12% bonds at a market (effective) interest rate of 10%, with interest payable semiannually. Compute the following, presenting figures used in your computations:

- a. The amount of cash proceeds from the sale of the bonds. Use the tables of present values in Exhibits 8 and 10. Round to the nearest dollar.
- b. The amount of premium to be amortized for the first semiannual interest payment period, using the interest method. Round to the nearest dollar.
- c. The amount of premium to be amortized for the second semiannual interest payment period, using the interest method. Round to the nearest dollar.
- d. The amount of the bond interest expense for the first year.

#### Appendix 1 and Appendix 2

# EX 12-26 Compute bond proceeds, amortizing discount by interest method, and interest expense

✓ a. \$71,167,524✓ b. \$670,051

Boyd Co. produces and sells aviation equipment. On the first day of its fiscal year, Boyd Co. issued \$80,000,000 of five-year, 9% bonds at a market (effective) interest rate of 12%, with interest payable semiannually. Compute the following, presenting figures used in your computations:

(Continued)

- a. The amount of cash proceeds from the sale of the bonds. Use the tables of present values in Exhibits 8 and 10. Round to the nearest dollar.
- b. The amount of discount to be amortized for the first semiannual interest payment period, using the interest method. Round to the nearest dollar.
- c. The amount of discount to be amortized for the second semiannual interest payment period, using the interest method. Round to the nearest dollar.
- d. The amount of the bond interest expense for the first year.

# **Problems: Series A**

#### PR 12-1A Effect of financing on earnings per share

OBJ. 1

✓ 1. Plan 3: \$1.44



Three different plans for financing an \$18,000,000 corporation are under consideration by its organizers. Under each of the following plans, the securities will be issued at their par or face amount, and the income tax rate is estimated at 40% of income:

	Plan 1	Plan 2	Plan 3
8% Bonds	_	_	\$ 9,000,000
Preferred 4% stock, \$20 par	_	\$ 9,000,000	4,500,000
Common stock, \$10 par	\$18,000,000	9,000,000	4,500,000
Total	\$18,000,000	\$18,000,000	\$18,000,000

#### **Instructions**

- 1. Determine the earnings per share of common stock for each plan, assuming that the income before bond interest and income tax is \$2,100,000.
- 2. Determine the earnings per share of common stock for each plan, assuming that the income before bond interest and income tax is \$1,050,000.
- 3. Discuss the advantages and disadvantages of each plan.

#### PR 12-2A Bond discount, entries for bonds payable transactions

**OBJ. 2, 3** 

On July 1, 2016, Merideth Industries Inc. issued \$28,500,000 of 10-year, 8% bonds at a market (effective) interest rate of 9%, receiving cash of \$26,646,292. Interest on the bonds is payable semiannually on December 31 and June 30. The fiscal year of the company is the calendar year.

#### **Instructions**

- 1. Journalize the entry to record the amount of cash proceeds from the issuance of the bonds on July 1, 2016.
- 2. Journalize the entries to record the following:
  - a. The first semiannual interest payment on December 31, 2016, and the amortization of the bond discount, using the straight-line method. (Round to the nearest dollar.)
  - b. The interest payment on June 30, 2017, and the amortization of the bond discount, using the straight-line method. (Round to the nearest dollar.)
- 3. Determine the total interest expense for 2016.
- 4. Will the bond proceeds always be less than the face amount of the bonds when the contract rate is less than the market rate of interest?
- 5. (Appendix 1) Compute the price of \$26,646,292 received for the bonds by using the present value tables in Appendix A at the end of the text. (Round to the nearest dollar.)

#### PR 12-3A Bond premium, entries for bonds payable transactions

OBJ. 2, 3

Saverin Inc. produces and sells outdoor equipment. On July 1, 2016, Saverin Inc. issued \$62,500,000 of 10-year, 9% bonds at a market (effective) interest rate of 8%, receiving cash of \$66,747,178. Interest on the bonds is payable semiannually on December 31 and June 30. The fiscal year of the company is the calendar year.

**✓** 3. \$1,232,685

General Ledger



3. \$2,600,141

General Ledger

### **Instructions**

- 1. Journalize the entry to record the amount of cash proceeds from the issuance of the bonds on July 1, 2016.
- 2. Journalize the entries to record the following:
  - a. The first semiannual interest payment on December 31, 2016, and the amortization of the bond premium, using the straight-line method. (Round to the nearest dollar.)
  - b. The interest payment on June 30, 2017, and the amortization of the bond premium, using the straight-line method. (Round to the nearest dollar.)
- 3. Determine the total interest expense for 2016.
- 4. Will the bond proceeds always be greater than the face amount of the bonds when the contract rate is greater than the market rate of interest?
- 5. (Appendix 1) Compute the price of 66,747,178 received for the bonds by using the present value tables in Appendix A at the end of the text. (Round to the nearest dollar.)

### PR 12-4A Entries for bonds payable and installment note transactions

OBJ. 3, 4

The following transactions were completed by Winklevoss Inc., whose fiscal year is the calendar year:

2016

- July 1. Issued \$74,000,000 of 20-year, 11% callable bonds dated July 1, 2016, at a market (effective) rate of 13%, receiving cash of \$63,532,267. Interest is payable semiannually on December 31 and June 30.
- Oct. 1. Borrowed \$200,000 by issuing a six-year, 6% installment note to Nicks Bank. The note requires annual payments of \$40,673, with the first payment occurring on September 30, 2017.
- Dec. 31. Accrued \$3,000 of interest on the installment note. The interest is payable on the date of the next installment note payment.
  - 31. Paid the semiannual interest on the bonds. The bond discount amortization of \$261,693 is combined with the semiannual interest payment.
  - 31. Closed the interest expense account.

2017

- June 30. Paid the semiannual interest on the bonds. The bond discount amortization of \$261,693 is combined with the semiannual interest payment.
- Sept. 30. Paid the annual payment on the note, which consisted of interest of \$12,000 and principal of \$28,673.
- Dec. 31. Accrued \$2,570 of interest on the installment note. The interest is payable on the date of the next installment note payment.
  - 31. Paid the semiannual interest on the bonds. The bond discount amortization of \$261,693 is combined with the semiannual interest payment.
  - 31. Closed the interest expense account.

2018

- June 30. Recorded the redemption of the bonds, which were called at 98. The balance in the bond discount account is \$9,420,961 after payment of interest and amortization of discount have been recorded. (Record the redemption only.)
- Sept. 30. Paid the second annual payment on the note, which consisted of interest of \$10,280 and principal of \$30,393.

### **Instructions**

- 1. Journalize the entries to record the foregoing transactions. Round all amounts to the nearest dollar.
- 2. Indicate the amount of the interest expense in (a) 2016 and (b) 2017.
- 3. Determine the carrying amount of the bonds as of December 31, 2017.

√ 3. \$64,317,346



General Ledger



# Appendix 1 and Appendix 2 PR 12-5A Bond discount, entries for bonds payable transactions, interest method of amortizing bond discount

√ 3. \$1,199,083

On July 1, 2016, Merideth Industries Inc. issued \$28,500,000 of 10-year, 8% bonds at a market (effective) interest rate of 9%, receiving cash of \$26,646,292. Interest on the bonds is payable semiannually on December 31 and June 30. The fiscal year of the company is the calendar year.

#### **Instructions**

- 1. Journalize the entry to record the amount of cash proceeds from the issuance of the bonds.
- 2. Journalize the entries to record the following:
  - a. The first semiannual interest payment on December 31, 2016, and the amortization of the bond discount, using the interest method. (Round to the nearest dollar.)
  - b. The interest payment on June 30, 2017, and the amortization of the bond discount, using the interest method. (Round to the nearest dollar.)
- 3. Determine the total interest expense for 2016.

# Appendix 1 and Appendix 2 PR 12-6A Bond premium, entries for bonds payable transactions, interest method of amortizing bond premium

√ 3. \$2,669,887

Saverin, Inc. produces and sells outdoor equipment. On July 1, 2016, Saverin, Inc. issued \$62,500,000 of 10-year, 9% bonds at a market (effective) interest rate of 8%, receiving cash of \$66,747,178. Interest on the bonds is payable semiannually on December 31 and June 30. The fiscal year of the company is the calendar year.

#### **Instructions**

- 1. Journalize the entry to record the amount of cash proceeds from the issuance of the bonds.
- 2. Journalize the entries to record the following:
  - a. The first semiannual interest payment on December 31, 2016, and the amortization of the bond premium, using the interest method. (Round to the nearest dollar.)
  - b. The interest payment on June 30, 2017, and the amortization of the bond premium, using the interest method. (Round to the nearest dollar.)
- 3. Determine the total interest expense for 2016.

# **Problems: Series B**

### PR 12-1B Effect of financing on earnings per share

OBJ. 1

✓ 1. Plan 3: \$2.84



Three different plans for financing an \$80,000,000 corporation are under consideration by its organizers. Under each of the following plans, the securities will be issued at their par or face amount, and the income tax rate is estimated at 40% of income:

	Plan 1	Plan 2	Plan 3
9% Bonds	_	_	\$40,000,000
Preferred 5% stock, \$25 par		\$40,000,000	20,000,000
Common stock, \$20 par	\$80,000,000	40,000,000	20,000,000
Total	\$80,000,000	\$80,000,000	\$80,000,000

### **Instructions**

- 1. Determine for each plan the earnings per share of common stock, assuming that the income before bond interest and income tax is \$10,000,000.
- 2. Determine for each plan the earnings per share of common stock, assuming that the income before bond interest and income tax is \$6,000,000.
- 3. Discuss the advantages and disadvantages of each plan.

OBJ. 2, 3

### √ 3. \$2,392,269



3. \$3,494,977

General Ledger



### Instructions

1. Journalize the entry to record the amount of cash proceeds from the issuance of the bonds on July 1, 2016.

On July 1, 2016, Livingston Corporation, a wholesaler of manufacturing equipment, issued

\$46,000,000 of 20-year, 10% bonds at a market (effective) interest rate of 11%, receiving

cash of \$42,309,236. Interest on the bonds is payable semiannually on December 31 and

2. Journalize the entries to record the following:

PR 12-2B Bond discount, entries for bonds payable transactions

June 30. The fiscal year of the company is the calendar year.

- a. The first semiannual interest payment on December 31, 2016, and the amortization of the bond discount, using the straight-line method. (Round to the nearest dollar.)
- b. The interest payment on June 30, 2017, and the amortization of the bond discount, using the straight-line method. (Round to the nearest dollar.)
- 3. Determine the total interest expense for 2016.
- 4. Will the bond proceeds always be less than the face amount of the bonds when the contract rate is less than the market rate of interest?
- 5. *(Appendix 1)* Compute the price of \$42,309,236 received for the bonds by using the present value tables in Appendix A at the end of the text. (Round to the nearest dollar.)

### PR 12-3B Bond premium, entries for bonds payable transactions

OBJ. 2, 3

Rodgers Corporation produces and sells football equipment. On July 1, 2016, Rodgers Corporation issued \$65,000,000 of 10-year, 12% bonds at a market (effective) interest rate of 10%, receiving cash of \$73,100,469. Interest on the bonds is payable semiannually on December 31 and June 30. The fiscal year of the company is the calendar year.

### **Instructions**

- 1. Journalize the entry to record the amount of cash proceeds from the issuance of the bonds on July 1, 2016.
- 2. Journalize the entries to record the following:
  - a. The first semiannual interest payment on December 31, 2016, and the amortization of the bond premium, using the straight-line method. (Round to the nearest dollar.)
  - b. The interest payment on June 30, 2017, and the amortization of the bond premium, using the straight-line method. (Round to the nearest dollar.)
- 3. Determine the total interest expense for 2016.
- 4. Will the bond proceeds always be greater than the face amount of the bonds when the contract rate is greater than the market rate of interest?
- 5. *(Appendix 1)* Compute the price of \$73,100,469 received for the bonds by using the present value tables in Appendix A at the end of the text. (Round to the nearest dollar.)

### **✓** 3. \$61,644,484



### General Ledger



### PR 12-4B Entries for bonds payable and installment note transactions

OBJ. 3, 4

The following transactions were completed by Montague Inc., whose fiscal year is the calendar year:

2016

- July 1. Issued \$55,000,000 of 10-year, 9% callable bonds dated July 1, 2016, at a market (effective) rate of 7%, receiving cash of \$62,817,040. Interest is payable semiannually on December 31 and June 30.
- Oct. 1. Borrowed \$450,000 by issuing a six-year, 8% installment note to Intexicon Bank. The note requires annual payments of \$97,342, with the first payment occurring on September 30, 2017.
- Dec. 31. Accrued \$9,000 of interest on the installment note. The interest is payable on the date of the next installment note payment.
  - 31. Paid the semiannual interest on the bonds. The bond discount amortization of \$390,852 is combined with the semiannual interest payment.
  - 31. Closed the interest expense account.

(Continued)

2017

- June 30. Paid the semiannual interest on the bonds. The bond discount amortization of \$390,852 is combined with the semiannual interest payment.
- Sept. 30. Paid the annual payment on the note, which consisted of interest of \$36,000 and principal of \$61,342.
- Dec. 31. Accrued \$7,773 of interest on the installment note. The interest is payable on the date of the next installment note payment.
  - 31. Paid the semiannual interest on the bonds. The bond discount amortization of \$390,852 is combined with the semiannual interest payment.
  - 31. Closed the interest expense account.

2018

- June 30. Recorded the redemption of the bonds, which were called at 103. The balance in the bond premium account is \$6,253,632 after payment of interest and amortization of premium have been recorded. (Record the redemption only.)
- Sept. 30. Paid the second annual payment on the note, which consisted of interest of \$31,093 and principal of \$66,249.

#### **Instructions**

- 1. Journalize the entries to record the foregoing transactions.
- 2. Indicate the amount of the interest expense in (a) 2016 and (b) 2017.
- 3. Determine the carrying amount of the bonds as of December 31, 2017.

### **Appendix 1 and Appendix 2**

# PR 12-5B Bond discount, entries for bonds payable transactions, interest method of amortizing bond discount

√ 3. \$2,327,008

On July 1, 2016, Livingston Corporation, a wholesaler of manufacturing equipment, issued \$46,000,000 of 20-year, 10% bonds at a market (effective) interest rate of 11%, receiving cash of \$42,309,236. Interest on the bonds is payable semiannually on December 31 and June 30. The fiscal year of the company is the calendar year.

### **Instructions**

- 1. Journalize the entry to record the amount of cash proceeds from the issuance of the bonds.
- 2. Journalize the entries to record the following:
  - a. The first semiannual interest payment on December 31, 2016, and the amortization of the bond discount, using the interest method. (Round to the nearest dollar.)
  - b. The interest payment on June 30, 2017, and the amortization of the bond discount, using the interest method. (Round to the nearest dollar.)
- 3. Determine the total interest expense for 2016.

### Appendix 1 and Appendix 2

# PR 12-6B Bond premium, entries for bonds payable transactions, interest method of amortizing bond premium

√ 3. \$3,655,023

Rodgers Corporation produces and sells football equipment. On July 1, 2016, Rodgers Corporation issued \$65,000,000 of 10-year, 12% bonds at a market (effective) interest rate of 10%, receiving cash of \$73,100,469. Interest on the bonds is payable semiannually on December 31 and June 30. The fiscal year of the company is the calendar year.

### **Instructions**

- 1. Journalize the entry to record the amount of cash proceeds from the issuance of the bonds.
- 2. Journalize the entries to record the following:
  - a. The first semiannual interest payment on December 31, 2016, and the amortization of the bond premium, using the interest method. (Round to the nearest dollar.)
  - b. The interest payment on June 30, 2017, and the amortization of the bond premium, using the interest method. (Round to the nearest dollar.)
- 3. Determine the total interest expense for 2016.

# **Cases & Projects**





### **CP 12-1** General Electric bond issuance

General Electric Capital, a division of General Electric, uses long-term debt extensively. In a recent year, GE Capital issued \$11 billion in long-term debt to investors, then within days filed legal documents to prepare for another \$50 billion long-term debt issue. As a result of the \$50 billion filing, the price of the initial \$11 billion offering declined (due to higher risk of more debt).

Bill Gross, a manager of a bond investment fund, "denounced a 'lack in candor' related to GE's recent debt deal. 'It was the most recent and most egregious example of how bondholders are mistreated.' Gross argued that GE was not forthright when GE Capital recently issued \$11 billion in bonds, one of the largest issues ever from a U.S. corporation. What bothered Gross is that three days after the issue the company announced its intention to sell as much as \$50 billion in additional debt, warrants, preferred stock, guarantees, letters of credit and promissory notes at some future date."

In your opinion, did GE Capital act unethically by selling \$11 billion of long-term debt without telling those investors that a few days later it would be filing documents to prepare for another \$50 billion debt offering?

Source: Jennifer Ablan, "Gross Shakes the Bond Market; GE Calms It, a Bit," Barron's, March 25, 2002.



Solar Industries develops and produces high-efficiency solar panels. The company has an outstanding \$10,000,000, 30-year, 10% bond issue dated July 1, 2011. The bond issue is due June 30, 2040. Some bond indentures require the corporation issuing the bonds to transfer cash to a special cash fund, called a sinking fund, over the life of the bond. Such funds help assure investors that there will be adequate cash to pay the bonds at their maturity date.

The bond indenture requires a bond sinking fund, which has a balance of \$1,200,000 as of July 1, 2016. The company is currently experiencing a shortage of funds due to a recent acquisition. Bob Lachgar, the company's treasurer, is considering using the funds from the bond sinking fund to cover payroll and other bills that are coming due at the end of the month. Bob's brother-in-law, a trustee of Solar's sinking fund, has indicated a willingness to allow Bob to use the funds from the sinking fund to temporarily meet the company's cash needs.

Discuss whether Bob's proposal is appropriate.

### **CP 12-3** Present values

Alex Kelton recently won the jackpot in the Colorado lottery while he was visiting his parents. When he arrived at the lottery office to collect his winnings, he was offered the following three payout options:

- a. Receive \$100,000,000 in cash today.
- b. Receive \$25,000,000 today and \$9,000,000 per year for eight years, with the first payment being received one year from today.
- c. Receive \$15,000,000 per year for 10 years, with the first payment being received one year from today.

Assuming that the effective rate of interest is 7%, which payout option should Alex select? Use the present value tables in Appendix A. Explain your answer and provide any necessary supporting calculations.

### CP 12-4 Preferred stock vs. bonds

Xentec Inc. has decided to expand its operations to owning and operating golf courses. The following is an excerpt from a conversation between the chief executive officer, Peter Kilgallon, and the vice president of finance, Dan Baron:

(Continued)



Peter: Dan, have you given any thought to how we're going to manage the acquisition of Sweeping Bluff Golf Course?

Dan: Well, the two basic options, as I see it, are to issue either preferred stock or bonds. The equity market is a little depressed right now. The rumor is that the Federal Reserve Bank's going to increase the interest rates either this month or next.

*Peter:* Yes, I've heard the rumor. The problem is that we can't wait around to see what's going to happen. We'll have to move on this next week if we want any chance to complete the acquisition of Sweeping Bluff Golf Course.

Dan: Well, the bond market is strong right now. Maybe we should issue debt this time around.

Peter: That's what I would have guessed as well. Sweeping Bluff Golf Course's financial statements look pretty good, except for the volatility of its income and cash flows. But that's characteristic of the industry.

Discuss the advantages and disadvantages of issuing preferred stock versus bonds.

### CP 12-5 Financing business expansion

You hold a 25% common stock interest in YouOwnIt, a family-owned construction equipment company. Your sister, who is the manager, has proposed an expansion of plant facilities at an expected cost of \$26,000,000. Two alternative plans have been suggested as methods of financing the expansion. Each plan is briefly described as follows:

- Plan 1. Issue \$26,000,000 of 20-year, 8% notes at face amount.
- Plan 2. Issue an additional 550,000 shares of \$10 par common stock at \$20 per share, and \$15,000,000 of 20-year, 8% notes at face amount.

The balance sheet as of the end of the previous fiscal year is as follows:

### YouOwnIt, Inc. Balance Sheet December 31, 2016

2 3 3 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7	
Assets	
Current assets	\$15,000,000
Property, plant, and equipment	22,500,000
Total assets	\$37,500,000
Liabilities and Stockholders' Equity	
Liabilities	\$11,250,000
Common stock, \$10	4,000,000
Paid-in capital in excess of par	500,000
Retained earnings	21,750,000
Total liabilities and stockholders' equity	\$37,500,000

Net income has remained relatively constant over the past several years. The expansion program is expected to increase yearly income before bond interest and income tax from \$2,667,000 in the previous year to \$5,000,000 for this year. Your sister has asked you, as the company treasurer, to prepare an analysis of each financing plan.

- 1. Prepare a table indicating the expected earnings per share on the common stock under each plan. Assume an income tax rate of 40%. Round to the nearest cent.
- 2. a. Discuss the factors that should be considered in evaluating the two plans.
  - b. Which plan offers the greater benefit to the present stockholders? Give reasons for your opinion.

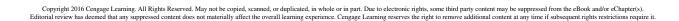
### CP 12-6 Number of times interest charges are earned



The following financial data (in thousands) were taken from recent financial statements of Staples, Inc.:

	Year 3	Year 2	Year 1
Interest expense	\$ 173,751	\$ 214,824	\$ 237,025
Earnings before taxes	1,459,141	1,356,595	1,155,894

- 1. What is the number of times interest charges are earned for Staples in Year 3, Year 2, and Year 1? (Round your answers to one decimal place.)
- 2. Evaluate this ratio for Staples.





# Investments and Fair Value Accounting

# The Coca-Cola Company

You invest cash to earn more cash. For example, you could deposit cash in a bank account to earn interest. You could also invest cash in preferred or common stocks and in corporate or U.S. government notes and bonds.

Preferred and common stock can be purchased through a stock exchange, such as the **New York Stock Exchange (NYSE)**. Preferred stock is purchased primarily with the expectation of earning dividends. Common stock is purchased with the expectation of earning dividends or realizing gains from a price increase in the stock.

Corporate and U.S. government bonds can also be purchased through a bond exchange. Bonds are purchased with the primary expectation of earning interest revenue.

Companies make investments for many of the same reasons that you would as an individual. For example,

**The Coca-Cola Company** has invested approximately \$3.1 billion of available cash in stocks and bonds. These investments are held by The Coca-Cola Company for interest, dividends, and expected price increases.

Unlike most individuals, however, companies also purchase significant amounts of the outstanding common stock of other companies for strategic reasons. For example, The Coca-Cola Company has more than \$9 billion invested in companies where they own between 20% and 50% of the outstanding shares. The vast majority of these investments are in independent bottlers, who bottle and distribute Coca-Cola products.

Investments in debt and equity securities give rise to a number of accounting issues. These issues are described and illustrated in this chapter.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe why companies invest in debt and equity securities. Why Companies Invest Investing Cash in Current Operations Investing Cash in Temporary Investments Investing Cash in Long-Term Investments	
Describe and illustrate the accounting for debt investments. Accounting for Debt Investments Purchase of Bonds Interest Revenue Sale of Bonds	EE 13-1
Describe and illustrate the accounting for equity investments.  Accounting for Equity Investments  Cost Method: Less Than 20% Ownership  Equity Method: Between 20%–50% Ownership  Consolidation: More Than 50% Ownership	EE 13-2 EE 13-3
Describe and illustrate valuing and reporting investments in the financial statements.  Valuing and Reporting Investments  Trading Securities  Available-for-Sale Securities  Held-to-Maturity Securities  Summary	EE 13-4 EE 13-5
Describe fair value accounting and its effects on the financial statements. Fair Value Accounting Effect of Fair Value Accounting on the Financial Statements	
Describe and illustrate the computation of dividend yield. Financial Analysis and Interpretation: Dividend Yield	EE 13-6
	At a Glance 13 Page 605



# **Why Companies Invest**

Most companies generate cash from their operations. This cash can be used for the following purposes:

- Investing in current operations
- Investing in temporary investments to earn additional revenue
- Investing in long-term investments in stock of other companies for strategic reasons

# **Investing Cash in Current Operations**

Cash is often used to support the current operating activities of a company. For example, cash may be used to replace worn-out equipment or to purchase new, more efficient and productive equipment. In addition, cash may be reinvested in the company to expand its current operations. For example, a retailer based in the northwest United States might decide to expand by opening stores in the Midwest.

To support its current level of operations, a company also uses cash to pay:

- expenses.
- suppliers of merchandise and other assets.
- interest to creditors.
- dividends to stockholders.

The accounting for the use of cash in current operations has been described and illustrated in earlier chapters. For example, Chapter 9, "Fixed Assets and Intangible Assets," illustrated the use of cash for purchasing property, plant, and equipment.

In this chapter, we describe and illustrate the use of cash for investing in temporary investments and the stock of other companies.

# Investing Cash in Temporary Investments

A company may temporarily have excess cash that is not needed for use in its current operations. This is often the case when a company has a seasonal operating cycle. For example, a significant portion of the annual merchandise sales of a retailer occurs during the fall holiday season. As a result, retailers often experience a large increase in cash during this period, which is not needed until the spring buying season.

Instead of letting excess cash remain idle in a checking account, most companies invest their excess cash in temporary investments. In doing so, companies invest in securities such as:

- Debt securities, which are notes and bonds that pay interest and have a fixed maturity date.
- Equity securities, which are preferred and common stock that represent ownership in a company and do not have a fixed maturity date.

Investments in debt and equity securities, termed investments or temporary investments, are reported in the Current Assets section of the balance sheet.

The primary objective of investing in temporary investments is to:

- earn interest revenue.
- receive dividends.
- realize gains from increases in the market price of the securities.

Investments in certificates of deposit and other securities that do not normally change in value are disclosed on the balance sheet as cash and cash equivalents. Such investments are held primarily for their interest revenue.

# Investing Cash in Long-Term Investments

A company may invest cash in the debt or equity of another company as a long-term investment. Long-term investments may be held for the same investment objectives as temporary investments. However, long-term investments often involve the purchase of a significant portion of the stock of another company. Such investments usually have a strategic purpose, such as:

- Reduction of costs: When one company buys another company, the combined company may be able to reduce administrative expenses. For example, a combined company does not need two chief executive officers (CEOs) or chief financial officers (CFOs).
- Replacement of management: If the purchased company has been mismanaged, the acquiring company may replace the company's management and, thus, improve operations and profits.
- Expansion: The acquiring company may purchase a company because it has a complementary product line, territory, or customer base. The new combined company may be able to serve customers better than the two companies could separately.
- Integration: A company may integrate operations by acquiring a supplier or customer. Acquiring a supplier may provide a more stable or uninterrupted supply of resources. Acquiring a customer may also provide a market for the company's products or services.



In 2012, **Dell** Computer purchased Quest

Software for \$2.4 billion. The acquisition allowed Dell to competitively expand into the software sector.

# **Accounting for Debt Investments**

Debt securities include notes and bonds issued by corporations and governmental organizations. Most companies invest excess cash in bonds as investments to earn interest revenue.

The accounting for bond investments¹ includes recording the following:

Purchase of bonds

- Interest revenue
- Sale of bonds



### **Purchase of Bonds**

The purchase of bonds is recorded by debiting an investments account for the purchase price of the bonds, including any brokerage commissions. (A *brokerage commission* is the fee charged by the agent who arranges the transaction between the buyer and seller.) If the bonds are purchased between interest dates, the purchase price includes accrued interest since the last interest payment. This is because the seller has earned the accrued interest, but the buyer will receive the accrued interest when it is paid.

To illustrate, assume that Homer Company purchases \$18,000 of U.S. Treasury bonds at their face amount on March 17, 2016, plus accrued interest for 45 days. The bonds have an interest rate of 6%, payable on July 31 and January 31.

The entry to record the purchase of the U.S. Treasury bonds is as follows:



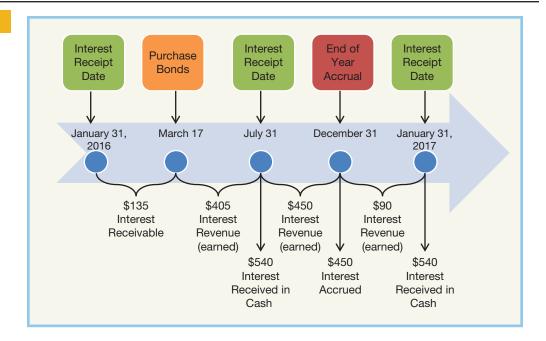
Because Homer Company purchased the bonds on March 17, it is also purchasing the accrued interest for 45 days (January 31 to March 17), as shown in Exhibit 1. The accrued interest of \$135 is computed as follows:²

Accrued Interest =  $$18,000 \times 6\% \times (45 \div 360) = $135$ 

The accrued interest is recorded by debiting Interest Receivable for \$135. Investments is debited for the purchase price of the bonds of \$18,000.

### EXHIBIT 1

**Interest Timeline** 



### **Interest Revenue**

On July 31, Homer Company receives a semiannual interest payment of \$540 (\$18,000  $\times$  6%  $\times$  ½). The \$540 interest includes the \$135 accrued interest that Homer Company purchased with the bonds on March 17. Thus, Homer has earned \$405 (\$540 - \$135) of interest revenue since purchasing the bonds, as shown in Exhibit 1.

¹ Debt investments may also include installment notes and short-term notes. The accounting for these debt investments is covered in intermediate and advanced accounting courses.

² To simplify, a 360-day year is used to compute interest.

The receipt of the interest on July 31 is recorded as follows:

²⁰¹⁶ <b>July</b>	31	Cash	540		
		Interest Receivable Interest Revenue		135 405	
		Received semiannual interest.		403	

Homer Company's accounting period ends on December 31. Thus, an adjusting entry must be made to accrue interest for five months (August 1 to December 31) of \$450 ( $$18,000 \times 6\% \times \frac{5}{12}$ ), as shown in Exhibit 1. The adjusting entry to record the accrued interest is as follows:

	2016 Dec. 31	Interest Receivable Interest Revenue Accrued 5 months of interest.		450	450	
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For the year ended December 31, 2016, Homer Company would report Interest Revenue of \$855 (\$405 + \$450) as part of Other Income on its income statement.

The receipt of the semiannual interest of \$540 on January 31, 2017, is recorded as follows:

²⁰¹⁷ Jan.	31	Cash	540	00	
		Interest Revenue		90	
		Interest Receivable		450	
		Received semiannual interest			

### Sale of Bonds

The sale of a bond investment normally results in a gain or loss. If the proceeds from the sale exceed the book value (cost) of the bonds, then a gain is recorded. If the proceeds are less than the book value (cost) of the bonds, a loss is recorded.

To illustrate, on January 31, 2017, Homer Company sells the Treasury bonds at 98, which is a price equal to 98% of their face amount. The sale results in a loss of \$360, computed as follows:

Proceeds from sale	\$17,640*
Less book value (cost) of the bonds	18,000
Loss on sale of bonds	\$ (360)
*\$18.000 × 98%	

The entry to record the sale is as follows:

2017 Jan.	31	Cash Loss on Sale of Investment Investments—U.S. Treasury Bonds Sold U.S. Treasury bonds.		17,640 360	18,000	
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There is no accrued interest upon the sale because the interest payment date is also January 31. If the sale were between interest dates, interest accrued since the last interest payment date would be added to the sale proceeds and credited to Interest Revenue. The loss on the sale of bond investments is reported as part of Other Income (Loss) on Homer Company's income statement.

### Example Exercise 13-1 Bond Investment Transactions



Journalize the entries to record the following selected bond investment transactions for Fly Company:

- 1. Purchased for cash \$40,000 of Tyler Company 10% bonds at 100 plus accrued interest of \$320.
- 2. Received the first semiannual interest.
- 3. Sold \$30,000 of the bonds at 102 plus accrued interest of \$110.

Follow My Example 13-1	
1. Investments—Tyler Company Bonds Interest Receivable Cash 2. Cash	40,000 320 40,320 2.000*
Interest Receivable Interest Revenue *\$40,000 $\times$ 10% $\times$ ½	320 1,680
3. Cash Interest Revenue Gain on Sale of Investments Investments—Tyler Company Bonds	30,710* 110 600 30,000
*Sale proceeds (\$30,000 × 102%)  Accrued interest  Total proceeds from sale	\$30,600 110 \$30,710

Practice Exercises: PE 13-1A, PE 13-1B



# **Accounting for Equity Investments**

A company may invest in the preferred or common stock of another company. The company investing in another company's stock is the **investor**. The company whose stock is purchased is the **investee**.

The percent of the investee's outstanding stock purchased by the investor determines the degree of control that the investor has over the investee. This, in turn, determines the accounting method used to record the stock investment, as shown in Exhibit 2.

### EXHIBIT 2

### **Stock Investments**

Percent of Outstanding Stock Owned by Investor	Degree of Control of Investor over Investee	Accounting Method
Less than 20%	No control	Cost method
Between 20% and 50%	Significant influence	Equity method
Greater than 50%	Control	Consolidation

# **Cost Method: Less Than 20% Ownership**

If the investor purchases less than 20% of the outstanding stock of the investee, the investor is considered to have no control over the investee. In this case, it is assumed that the investor purchased the stock primarily to earn dividends or to realize gains on price increases of the stock.

Investments of less than 20% of the investee's outstanding stock are accounted for using the **cost method**. Under the cost method, entries are recorded for the following transactions:

- · Purchase of stock
- Receipt of dividends
- Sale of stock

**Purchase of Stock** The purchase of stock is recorded at its cost. Any brokerage commissions are included as part of the cost.

To illustrate, assume that on May 1, Bart Company purchases 2,000 shares of Lisa Company common stock at \$49.90 per share plus a brokerage commission of \$200. The entry to record the purchase of the stock is as follows:

	May	1	Investments—Lisa Company Stock Cash Purchased 2,000 shares of Lisa Company common stock [(\$49.90 × 2,000 shares) + \$200].		100,000	100,000	
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**Receipt of Dividends** On July 31, Bart Company receives a dividend of \$0.40 per share from Lisa Company. The entry to record the receipt of the dividend is as follows:

July	31	Cash Dividend Revenue Received dividend on Lisa Company common stock (2,000 shares × \$0.40).	800	800	

Dividend Revenue is reported as part of Other Income on Bart Company's income statement.

**Sale of Stock** The sale of a stock investment normally results in a gain or loss. A gain is recorded if the proceeds from the sale exceed the book value (cost) of the stock. A loss is recorded if the proceeds from the sale are less than the book value (cost).

To illustrate, on September 1, Bart Company sells 1,500 shares of Lisa Company stock for \$54.50 per share, less a \$160 commission. The sale results in a gain of \$6,590, computed as follows:

Proceeds from sale	\$81,590*
Book value (cost) of the stock	75,000**
Gain on sale	\$ 6,590
*(\$54.50 × 1,500 shares) – \$160	<del></del>
**(\$100.000 $\div$ 2.000 shares) $\times$ 1.500 shares	

The entry to record the sale is as follows:

Sept. 1 Cash Gain on Sale of Investments Investments—Lisa Company Stock Sold 1,500 shares of Lisa Company common stock.	81,590	6,590 75,000	
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The gain on the sale of investments is reported as part of Other Income on Bart Company's income statement.

### Example Exercise 13-2 Stock Investment Transactions



On September 1, 1,500 shares of Monroe Company are acquired at a price of \$24 per share plus a \$40 brokerage commission. On October 14, a \$0.60-per-share dividend was received on the Monroe Company stock. On November 11, 750 shares (half) of Monroe Company stock were sold for \$20 per share, less a \$45 brokerage commission. Prepare the journal entries for the original purchase, dividend, and sale.

Follow N	Follow My Example 13-2					
Sept. 1	Investments—Monroe Company Stock	36,040*	36,040			
Oct. 14	Cash	900*	900			
Nov. 11	Cash	14,955* 3,065	18,020**			

# **Equity Method: Between 20%-50% Ownership**

If the investor purchases between 20% and 50% of the outstanding stock of the investee, the investor is considered to have a *significant influence* over the investee. In this case, it is assumed that the investor purchased the stock primarily for strategic reasons, such as developing a supplier relationship.

Practice Exercises: PE 13-2A, PE 13-2B

Investments of between 20% and 50% of the investee's outstanding stock are accounted for using the **equity method**. Under the equity method, the stock is recorded initially at its cost, including any brokerage commissions. This is the same as under the cost method.

Under the equity method, the investment account is adjusted for the investor's share of the net income and dividends of the investee. These adjustments are as follows:

- *Net Income*: The investor records its share of the net income of the investee as an increase in the investment account. Its share of any net loss is recorded as a decrease in the investment account.
- Dividends: The investor's share of cash dividends received from the investee decreases the investment account.

**Purchase of Stock** To illustrate, assume that Simpson Inc. purchased its 40% interest in Flanders Corporation's common stock on January 2, 2016, for \$350,000. The entry to record the purchase is as follows:

2016 Jan.	2	Investment in Flanders Corporation Stock  Cash  Purchased 40% of Flanders  Corporation stock.		350,000	350,000	
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**Recording Investee Net Income** For the year ended December 31, 2016, Flanders Corporation reported net income of \$105,000. Under the equity method, Simpson Inc. (the investor) records its share of Flanders net income, as follows:

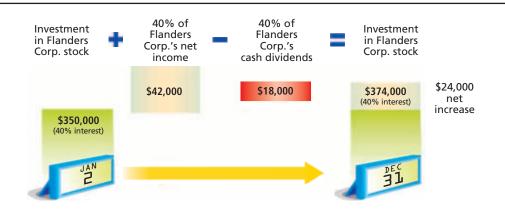
2016 Dec. 3	Investment in Flanders Corporation Stock Income of Flanders Corporation Recorded 40% share of Flanders Corporation net income, \$105,000 × 40%.	42,000	42,000	
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Income of Flanders Corporation is reported on Simpson Inc.'s income statement. Depending on its significance, it may be reported separately or as part of *Other Income*. If Flanders had a loss during the period, then the journal entry would be a debit to Loss of Flanders Corporation and a credit to the investment account.

**Recording Investee Dividends** During the year, Flanders Corporation declared and paid cash dividends of \$45,000. Under the equity method, Simpson Inc. (the investor) records its share of Flanders dividends as follows:

2016 Dec.	Recorded 40°	nders Corporation Stock 6 share of Flanders lividends, \$45,000 × 40%.		18,000	18,000	
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The effect of recording 40% of Flanders Corporation's net income and dividends is to increase the investment account by \$24,000 (\$42,000 - \$18,000). Thus, Investment in Flanders Corporation Stock increases from \$350,000 to \$374,000, as shown in Exhibit 3.



**EXHIBIT 3** 

Investment and Dividends

Under the equity method, the investment account reflects the investor's proportional changes in the net book value of the investee. For example, Flanders Corporation's net book value increased by 60,000 (net income of 105,000 less dividends of 45,000) during the year. As a result, Simpson Inc.'s share of Flanders' net book value increased by 44,000 ( $60,000 \times 40\%$ ). Investments accounted for under the equity method are classified on the balance sheet as noncurrent assets.

**Sale of Stock** Under the equity method, a gain or loss is normally recorded from the sale of an investment. A gain is recorded if the proceeds exceed the *book value* of the investment. A loss is recorded if the proceeds are less than the *book value* of the investment.

To illlustrate, if Simpson Inc. sold Flanders Corporation's stock on January 1, 2017, for \$400,000, a gain of \$26,000 would be reported, computed as follows:

Proceeds from sale	\$400,000
Book value of stock investment	374,000
Gain on sale	\$ 26,000

The entry to record the sale is as follows:

²⁰¹⁷ Jan.	1	Cash	400,000		
		Investment in Flanders Corporation Stock		374,000	
		Gain on Sale of Flanders Corporation Stock		26,000	
		Sold Flanders Corporation stock.			

# Example Exercise 13-3 Equity Method



On January 2, Olson Company acquired 35% of the outstanding stock of Bryant Company for \$140,000. For the year ended December 31, Bryant Company earned income of \$44,000 and paid dividends of \$20,000. Prepare the entries for Olson Company for the purchase of the stock, the share of Bryant income, and the dividends received from Bryant Company.

Follow	Follow My Example 13-3					
Jan. 2	Investment in Bryant Company Stock	140,000				
	Cash	140,000				
Dec. 31	Investment in Bryant Company Stock	15,400*				
	Income of Bryant Company	15,400				
	*Recorded 35% of Bryant income, 35% $\times$ \$44,000					
Dec. 31	Cash	7,000*				
	Investment in Bryant Company Stock	7,000				
	*Recorded 35% of Bryant's \$20,000 dividend, $35\% \times $20,000$					
•••••						
		Practice Exercises: PE 13-3A, PE 13-3B				

# **Consolidation: More Than 50% Ownership**

If the investor purchases more than 50% of the outstanding stock of the investee, the investor is considered to have *control* over the investee. In this case, it is assumed that the investor purchased the stock of the investee primarily for strategic reasons.

The purchase of more than 50% ownership of the investee's stock is termed a **business combination**. Companies may combine in order to produce more efficiently, diversify product lines, expand geographically, or acquire know-how.

A corporation owning all or a majority of the voting stock of another corporation is called a **parent company**. The corporation that is controlled is called the **subsidiary company**.

Parent and subsidiary corporations often continue to maintain separate accounting records and prepare their own financial statements. In such cases, at the end of the year, the financial statements of the parent and subsidiary are combined and reported as a single company. These combined financial statements are called **consolidated financial statements**. Such statements are normally identified by adding *and Subsidiary(ies)* to the name of the parent corporation or by adding *Consolidated* to the statement title.

To the external stakeholders of the parent company, consolidated financial statements are more meaningful than separate statements for each corporation. This is because the parent company, in substance, controls the subsidiaries. The accounting for business combinations, including preparing consolidated financial statements, is described and illustrated in advanced accounting courses and textbooks.



# Business Connection

### **MORE CASH MEANS MORE INVESTMENTS FOR DRUG COMPANIES**

Patented drugs are the life blood of the pharmaceutical industry. Drug companies with extensive portfolios of patented drugs generate huge cash flows from operating activities. As a result, these companies often have vast amounts of cash on hand to invest in other companies. Near the end of 2012, the five biggest drug makers had in excess of \$70 billion in cash and investments. Many analysts anticipated that these companies would use this excess cash to acquire smaller biotechnology and drug companies for their patented drugs and their ongoing research activities.

Source: "Mergers and Acquisitions on the Rise in 2013 as Big Pharma Companies Hold Record Amounts of Cash on Hand," Five Star Equities Market Research Report. Feb. 7, 2013.

# **Valuing and Reporting Investments**



Describe and illustrate

valuing and reporting investments in the financial statements.

Debt and equity securities are *financial assets* that are often traded on public exchanges such as the New York Stock Exchange. As a result, their market value can be observed and, thus, objectively determined. For this reason, generally accepted accounting principles (GAAP) allows some debt securities, and requires equity securities where there is less than a 20% ownership interest to be valued in the accounting records and financial statements at their fair market values.

These securities are classified as follows:

- Trading securities
- · Available-for-sale securities
- Held-to-maturity securities

# **Trading Securities**

Trading securities are debt and equity securities that are purchased to earn shortterm profits from changes in their market prices. Trading securities are often held by banks, mutual funds, insurance companies, and other financial institutions.

Because trading securities are held as a short-term investment, they are reported as a current asset on the balance sheet. Trading securities are valued as a portfolio (group) of securities using the securities' fair values. Fair value is the market price that the company would receive for a security if it were sold. A change in the fair value of the portfolio (group) of trading securities is recognized as an unrealized gain or loss for the period.

To illustrate, assume Maggie Company purchased a portfolio of trading securities during 2016. On December 31, 2016, the cost and fair values of the securities were as follows:

Name	<b>Number of Shares</b>	Total Cost	<b>Total Fair Value</b>
Armour Company	400	\$ 5,000	\$ 7,200
Maven, Inc.	500	11,000	7,500
Polaris Co.	200	8,000	10,600
Total		\$24,000	\$25,300

The portfolio of trading securities is reported at its fair value of \$25,300. An adjusting entry is made to record the increase in the fair value of \$1,300 (\$25,300 - \$24,000). In order to maintain a record of the original cost of the securities, a valuation account, called Valuation Allowance for Trading Investments, is debited for \$1,300, and Unrealized Gain on Trading Investments is credited for \$1,300.3 The adjusting entry on



December 31, 2016, to record the fair value of the portfolio of trading securities is as follows:

	²⁰¹⁶ Dec. 3	1 Valuation Allowance for Trading Investments Unrealized Gain on Trading Investments To record increase in fair value of trading securities.		1,300	1,300	
--	------------------------	----------------------------------------------------------------------------------------------------------------------------------------------	--	-------	-------	--

Unrealized Gain on Trading Investments is reported on the income statement. Depending on its significance, it may be reported separately or as Other Income on the income statement. The valuation allowance is reported on the December 31, 2016, balance sheet as follows:

Maggie Company Balance Sheet (selected items) December 31, 2016		
Current assets:		\$120,000
Trading investments (at cost)	\$24,000 	25,300

If the fair value of the portfolio of trading securities was less than the cost, then the adjustment would debit Unrealized Loss on Trading Investments and credit Valuation Allowance for Trading Investments for the difference. Unrealized Loss on Trading Investments would be reported on the income statement as Other Expenses. Valuation Allowance for Trading Investments would be shown on the balance sheet as a *deduction* from Trading Investments (at cost).

Over time, the valuation allowance account is adjusted to reflect the difference between the cost and the fair value of the portfolio. Thus, increases in the valuation allowance account from the beginning of the period will result in an adjustment to record an unrealized gain, similar to the preceding journal entry. Likewise, decreases in the valuation allowance account from the beginning of the period will result in an adjustment to record an unrealized loss.

## Example Exercise 13-4 Valuing Trading Securities at Fair Value



On January 1, 2016, Valuation Allowance for Trading Investments had a zero balance. On December 31, 2016, the cost of the trading securities portfolio was \$79,200, and the fair value was \$76,800. Prepare the December 31, 2016, adjusting journal entry to record the unrealized gain or loss on trading investments.

# Follow My Example 13-4

2016			
Dec. 31	Unrealized Loss on Trading Investments	2,400	
	Valuation Allowance for Trading Investments		2,400*
	To record decrease in fair value of trading investments.		
*Trading in	vestments at fair value, December 31, 2016	\$ 76,800	
Less tradi	ng investments at cost, December 31, 2016	79,200	
Unrealized	d loss on trading investments	\$ (2,400)	

Practice Exercises: PE 13-4A, PE 13-4B

³ We assume that the valuation allowance account has a beginning balance of zero to simplify our illustrations.

# Integrity, Objectivity, and Ethics in Business



### **SOCIALLY RESPONSIBLE INVESTING**

Socially responsible investing is a growing trend in the United States and Europe that focuses on making investments to improve society. Socially responsible investors attempt to balance investment return with social good by seeking out investments in companies that (1) are environmentally friendly, (2) do not infringe on human rights in the

production of a product or provision of a service, and (3) are anti-discriminatory. In some situations, socially responsible investors target emerging markets to both generate a return and help overcome social challenges. In addition, some socially responsible investors refuse to invest in companies that produce alcohol, tobacco, or weapons.

### **Available-for-Sale Securities**

**Available-for-sale securities** are debt and equity securities that are neither held for trading, held to maturity, nor held for strategic reasons. The accounting for available-for-sale securities is similar to the accounting for trading securities, except for the reporting of changes in fair values. Specifically, changes in the fair values of *trading securities* are reported as an unrealized gain or loss on the income statement. In contrast, changes in the fair values of *available-for-sale securities* are reported as part of stockholders' equity and, thus, excluded from the income statement.



To illustrate, assume that Maggie Company purchased the three securities during 2016 as available-for-sale securities instead of trading securities. On December 31, 2016, the cost and fair values of the securities were as follows:

Name	<b>Number of Shares</b>	<b>Total Cost</b>	<b>Total Fair Value</b>
Armour Company	400	\$ 5,000	\$ 7,200
Maven, Inc.	500	11,000	7,500
Polaris Co.	200	8,000	10,600
Total		\$24,000	\$25,300

The portfolio of available-for-sale securities is reported at its fair value of \$25,300. An adjusting entry is made to record the increase in fair value of \$1,300 (\$25,300 – \$24,000). In order to maintain a record of the original cost of the securities, a valuation account, called *Valuation Allowance for Available-for-Sale Investments*, is debited for \$1,300. This account is similar to the valuation account used for trading securities.

Unlike trading securities, the December 31, 2016, adjusting entry credits a stock-holders' equity account instead of an income statement account.⁴ The \$1,300 increase in fair value is credited to Unrealized Gain (Loss) on Available-for-Sale Investments.

The adjusting entry on December 31, 2016, to record the fair value of the portfolio of available-for-sale securities is as follows:

2016 Dec.	31	Valuation Allowance for Available-for- Sale Investments Unrealized Gain (Loss) on Available-for- Sale Investments To record increase in fair value of available-for-sale investments.		1,300	1,300	
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A credit balance in Unrealized Gain (Loss) on Available-for-Sale Investments is added to stockholders' equity, while a debit balance is subtracted from stockholders' equity.

The valuation allowance and the unrealized gain are reported on the December 31, 2016, balance sheet as follows:



As shown, Unrealized Gain (Loss) on Available-for-Sale Investments is reported as an addition to stockholders' equity. In future years, the cumulative effects of unrealized gains and losses are reported in this account. Because 2014 was the first year that Maggie Company purchased available-for-sale securities, the unrealized gain is reported as the balance of Unrealized Gain (Loss) on Available-for-Sale Investments. This treatment is supported under the theory that available-for-sale securities will be held longer than trading securities, so changes in fair value over time have a greater opportunity to cancel out. Thus, these changes are not reported on the income statement, as is the case with trading securities.

If the fair value was less than the cost, then the adjustment would debit Unrealized Gain (Loss) on Available-for-Sale Investments and credit Valuation Allowance for Available-for-Sale Investments for the difference. Unrealized Gain (Loss) on Trading Investments would be reported in the Stockholders' Equity section as a negative item. Valuation Allowance for Available-for-Sale Investments would be shown on the balance sheet as a deduction from Available-for-Sale Investments (at cost).

Over time, the valuation allowance account is adjusted to reflect the difference between the cost and the fair value of the portfolio. Thus, increases in the valuation allowance from the beginning of the period will result in an adjustment to record an increase in the valuation and unrealized gain (loss) accounts, similar to the journal entry illustrated earlier. Likewise, decreases in the valuation allowance from the beginning of the period will result in an adjustment to record decreases in the valuation and unrealized gain (loss) accounts.

⁴This is a rare exception to the rule that every adjusting entry must affect an income statement and a balance sheet account.

### Example Exercise 13-5 Valuing Available-for-Sale Securities at Fair Value



On January 1, 2016, Valuation Allowance for Available-for-Sale Investments had a zero balance. On December 31, 2016, the cost of the available-for-sale securities was \$45,700, and the fair value was \$50,000.

Prepare the adjusting entry to record the unrealized gain or loss for available-for-sale investments on December 31, 2016.

### Follow My Example 13-5

2016		
Dec. 31 Valuation Allowance for Available-for-Sale Investments	4,300*	
Unrealized Gain (Loss) on Available-for-Sale Investments	4,300	
To record increase in fair value of available-for-sale securities.		
*Available-for-sale investments at fair value, December 31, 2016	\$50,000	
Less available-for-sale investments at cost, December 31, 2016	45,700	
Unrealized gain (loss) on available-for-sale investments	\$ 4,300	

Practice Exercises: PE 13-5A, PE 13-5B

# **Held-to-Maturity Securities**

**Held-to-maturity securities** are debt investments, such as notes or bonds, that a company intends to hold until their maturity date. Held-to-maturity securities are primarily purchased to earn interest revenue.

If a held-to-maturity security will mature within a year, it is reported as a current asset on the balance sheet. Held-to-maturity securities maturing beyond a year are reported as noncurrent assets.

Only securities with maturity dates, such as corporate notes and bonds, are classified as held-to-maturity securities. Equity securities are not held-to-maturity securities because they have no maturity date.

Held-to-maturity bond investments are recorded at their cost, including any brokerage commissions, as illustrated earlier in this chapter. If the interest rate on the bonds differs from the market rate of interest, the bonds may be purchased at a premium or discount. In such cases, the premium or discount is amortized over the life of the bonds.

Held-to-maturity bond investments are reported on the balance sheet at their amortized cost. The accounting for held-to-maturity investments, including premium and discount amortization, is described in advanced accounting texts.

# Summary

Exhibit 4 summarizes the valuation and balance sheet reporting of trading, available-for-sale, and held-to-maturity securities.

### **EXHIBIT 4**

Summary of Valuing and Reporting of Investments

	Trading Securities	Available-for-Sale Securities	Held-to-Maturity Securities
Valued at:	Fair Value	Fair Value	Amortized Cost
Changes in valuation are reported as:	Unrealized gain or loss in the income statement as Other income (loss).	Accumulated unrealized gain or loss is reported in stockholders' equity on the balance sheet.	Not applicable. Held- to-Maturity Securities are reported at cost.*
Reported on the balance sheet as:	Cost of investments plus or minus valuation allowance.	Cost of investments plus or minus valuation allowance.	Amortized cost of investment.
Classified on balance sheet as:	A current asset.	Either as a current or noncurrent asset, depending on management's intent.	Either as a current or noncurrent asset, depending on remaining term to maturity.

Common stock investments in trading and available-for-sale securities are normally less than 20% of the outstanding common stock of the investee. The portfolios are reported at fair value using the valuation allowance account, while the individual securities are accounted for using the cost method. Investments between 20% and 50% of the outstanding common stock of the investee are accounted for using the equity method illustrated earlier in this chapter. Equity method investments are classified as noncurrent assets on the balance sheet.

The balance sheet reporting for the investments of Mornin' Joe follows:



Mornin' Joe Balance Sheet December 31, 2016	3		
Assets			
Current assets:			
Cash and cash equivalents		\$235,000	
Trading investments (at cost)	\$420,000		
Plus valuation allowance for trading investments	45,000	465,000	
Accounts receivable	\$305,000		
Less allowance for doubtful accounts	12,300	292,700	
Merchandise inventory—at lower of cost			
(first-in, first-out method) or market		120,000	
Prepaid insurance		24,000	
Total current assets			\$1,136,70
Investments:			
Investment in AM Coffee (equity method)			565,00
Property, plant, and equipment:			

Mornin' Joe invests in trading securities and does not have investments in held-to-maturity or available-for-sale securities. Mornin' Joe also owns 40% of AM Coffee Corporation, which is accounted for using the equity method. Mornin' Joe intends to keep its investment in AM Coffee indefinitely for strategic reasons; thus, its investment in AM Coffee is classified as a noncurrent asset. Such investments are normally reported before property, plant, and equipment.

Mornin' Joe reported an Unrealized Gain on Trading Investments of \$5,000 and Equity Income in AM Coffee of \$57,000 in the Other Income and Expense section of its income statement, as follows:

#### Mornin' Joe **Income Statement** For the Year Ended December 31, 2016 Revenue from sales: Sales ..... \$5,450,000 \$26,500 Sales discounts ..... 21,400 47,900 Sales ..... \$5,402,100 Cost of merchandise sold ..... 2,160,000 Gross profit ..... \$3,242,100 Total operating expenses ..... 2,608,700 Income from operations ..... \$ 633,400 Other income and expense: Interest revenue..... \$ 18,000 (136,000)Interest expense..... (23,000)Unrealized gain on trading investments..... 5,000 Equity income in AM Coffee ..... 57,000 (79,000)Income before income taxes ..... \$ 554,400 Income tax expense ..... 132,800 \$ 421,600





# Business Connection

### WARREN BUFFETT: THE SAGE OF OMAHA

Beginning in 1962, Warren Buffett, one of the world's wealthiest and most successful investors, began buying shares of Berkshire Hathaway. He eventually took control of the company and transformed it from a textile manufacturing company into an investment holding company. Today, Berkshire Hathaway holds more than \$125 billion in cash and cash equivalents, equity securities, and debt securities. Berkshire's largest holdings include The Coca-Cola Company, American Express, Wells Fargo, and Procter & Gamble. Berkshire Class A common stock trades near \$155,000 per share, the highest priced share on the New York Stock Exchange. These shares would have given an investor more than a 1,800% return since 1990.

Buffett compares his investment style to hitting a baseball: "Ted Williams, one of the greatest hitters in the game, stated, 'my argument is, to be a good hitter, you've got to get a good ball to hit. It's the first rule of the book. If I have to bite at stuff that is out of my happy zone, I'm not a .344 hitter. I might only be a .250 hitter." Buffett states, "Charlie (Buffett's partner) and I agree and will try to wait for (investment) opportunities that are well within our 'happy zone." One of Buffet's recent "happy zone" investments was the acquisition of Burlington Northern Santa Fe Railroad for \$34 billion.

Warren Buffett as the CEO of Berkshire Hathaway earns a salary of only \$100,000 per year, which is the lowest CEO salary for a company of its size in the United States. However, he personally owns approximately 38% of the company, making him worth more than \$40 billion. What will Buffett do with this wealth? He has decided to give nearly all of it to philanthropic causes through the Bill and Melinda Gates Foundation.

Source: Warren E. Buffett, *The Essays of Warren Buffett: Lessons for Corporate America*, edited by Lawrence A. Cunningham, p. 234.



# **Fair Value Accounting**

Fair value is the price that would be received to sell an asset or pay off a liability. Fair value assumes that this transaction occurs under *normal* business conditions.

As illustrated earlier, generally accepted accounting principles require trading and available-for-sale investments to be recorded at their fair value. This differs from the traditional historical cost measurement basis, which records assets such as inventory and property, plant, and equipment at their purchase price. As a result, financial statements include some assets that are reported at their historical cost (inventory, property, plant, and equipment), and other assets that are reported at their fair value (trading, and available-for-sale securities).

Over the past several decades, the financial statements of companies in most industries have included more fair value measures. This is partially due to the Financial Accounting Standards Board's increased willingness to apply fair value to certain assets and transactions. As the ability to measure fair value becomes more reliable, a greater number of assets and transactions are likely to be reported at fair value. A more detailed discussion of fair value is provided in intermediate and advanced financial accounting courses.

# **Effect of Fair Value Accounting on the Financial Statements**

The use of fair values for valuing assets and liabilities affects the financial statements. Specifically, the balance sheet and income statement could be affected.

**Balance Sheet** When an asset or a liability is reported at its fair value, any difference between the asset's original cost or prior period's fair value must be recorded. As we illustrated for trading and available-for-sale securities, this difference is reported in a valuation allowance. The account, Valuation Allowance for Trading Investments, was used earlier in this chapter to adjust trading securities to their fair values.

Available-for-sale securities are reported at fair value in the balance sheet. Changes in their fair values are not recognized on the income statement, but are included as part of stockholders' equity through the comprehensive income and accumulated other comprehensive income accounts. These accounts are described in the appendix to this chapter.

**Income Statement** Trading securities are also reported at fair value in the balance sheet. However, instead of recording the changes in the fair values of trading securities as part of stockholders' equity, the unrealized gains or losses are reported on the income statement.





# Financial Analysis and Interpretation: Dividend Yield

The **dividend yield** measures the rate of return to stockholders, based on cash dividends. Dividend yield is most often computed for common stock because preferred stock has a stated dividend rate. In contrast, the cash dividends paid on common stock normally vary with the profitability of the corporation.

The dividend yield is computed as follows:

Dividend Yield = Dividends per Share of Common Stock

Market Price per Share of Common Stock

To illustrate, the market price of The Coca-Cola Company was \$40.69 on March 26, 2013. During the preceding year, The Coca-Cola Company had paid dividends of \$1.05 per share. Thus, the dividend yield of The Coca-Cola Company's common stock is computed as follows:

Dividend Yield = 
$$\frac{\text{Dividends per Share of Common Stock}}{\text{Market Price per Share of Common Stock}} = \frac{\$1.05}{\$40.69} = 2.6\%$$

The Coca-Cola Company pays a dividend yield of slightly less than 2.6%. The dividend yield is first a function of a company's profitability, or ability to pay a dividend. For example, many banks nearly eliminated their dividends during the banking crisis of 2008 because they had significant losses. The Coca-Cola Company has sufficient profitability to pay a dividend. Secondly, a company's dividend yield is a function of management's alternative use of funds. If a company has sufficient growth opportunities, funds may be directed toward internal investment, rather than toward paying dividends.

The dividend yield will vary from day to day because the market price of a corporation's stock varies day to day. Current dividend yields are provided with news service quotations of market prices, such as The Wall Street Journal or Yahoo! Finance.

Recent dividend yields for some selected companies are as follows:

Company	Dividend Yield (%)
Facebook	None
Best Buy	2.20
Coca-Cola Company	2.60
Duke Energy	4.30
Google	None
Hewlett-Packard	2.10
Microsoft	2.80
<b>Verizon Communications</b>	4.10

As can be seen, the dividend yield varies widely across firms. Growth firms tend to retain their earnings to fund future growth. Thus, Facebook and Google pay no dividends, and Hewlett-Packard has a relatively small dividend. Common stockholders of these companies expect to earn most of their return from stock price appreciation. In contrast, Duke Energy and Verizon Communications are regulated utilities that provide a return to common stockholders mostly through dividends. Best Buy, Coca-Cola, and Microsoft provide a mix of dividends and expected stock price appreciation to their common stockholders.

# Example Exercise 13-6 Dividend Yield



On March 11, 2016, Sheldon Corporation had a market price of \$58 per share of common stock. For the previous year, Sheldon paid an annual dividend of \$2.90 per share. Compute the dividend yield for Sheldon Corporation.

# Follow My Example 13-6

Dividend Yield = 
$$\frac{$2.90}{$58}$$
 = 0.05, or 5%

Practice Exercises: PE 13-6A, PE 13-6B

# A P P E N D I X

# **Comprehensive Income**

**Comprehensive income** is defined as all changes in stockholders' equity during a period, except those resulting from dividends and stockholders' investments. Comprehensive income is computed by adding or subtracting *other comprehensive income* to (from) net income, as follows:

Net income	\$XXX
Other comprehensive income	XXX
Comprehensive income	\$XXX

Other comprehensive income items include unrealized gains and losses on available-for-sale securities as well as other items such as foreign currency and pension liability adjustments. The *cumulative* effect of other comprehensive income is reported on the balance sheet, as accumulated other comprehensive income.

Companies are required to report comprehensive income in the financial statements in one of the following two ways:

- On the income statement, or
- In a separate statement of comprehensive income that immediately follows the income statement.

In the earlier illustration, Maggie Company had reported an unrealized gain of \$1,300 on available-for-sale investments. This unrealized gain would be reported in the Stockholders' Equity section of Maggie's 2016 balance sheet, as follows:

Maggie Company Balance Sheet December 31, 2016	
Stockholders' equity:	<b>.</b> 10.000
Common stock	\$ 10,000 150,000
Retained earnings	250,000
Unrealized gain (loss) on available-for-sale investments	1,300 \$411,300
Total stockholders equity	3411,300

Alternatively, Maggie Company could have reported the unrealized gain as part of accumulated other comprehensive income as follows:

Maggie Company Balance Sheet December 31, 2016	
Stockholders' equity: Common stock. Paid-in capital in excess of par Retained earnings. Accumulated other comprehensive income: Unrealized gain on available-for-sale investments.	\$ 10,000 150,000 250,000
Total stockholders' equity	\$411,300

# At a Glance 13



### Describe why companies invest in debt and equity securities.

**Key Points** Cash can be used to (1) invest in current operations, (2) invest to earn additional revenue in marketable securities, or (3) invest in marketable securities for strategic reasons.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the ways excess cash is used by a business.</li> </ul>		
• Describe the purpose of temporary investments.		
• Describe the strategic purpose of long-term investments.		



### Describe and illustrate the accounting for debt investments.

**Key Points** The accounting for debt investments includes recording the purchase, interest revenue, and sale of the debt. Both the purchase and sale date may include accrued interest.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Prepare journal entries to record the purchase of a debt investment, including accrued interest.</li> </ul>	EE13-1	PE13-1A, 13-1B
• Prepare journal entries for interest revenue from debt investments.	EE13-1	PE13-1A, 13-1B
• Prepare journal entries to record the sale of a debt investment at a gain or loss.	EE13-1	PE13-1A, 13-1B



### Describe and illustrate the accounting for equity investments.

**Key Points** The accounting for equity investments differs, depending on the degree of control. Accounting for investments of less than 20% of the outstanding stock (no control) of the investee includes recording the purchase of stock, the receipt of dividends, and the sale of stock at a gain or loss. Investments of 20%–50% of the outstanding stock of an investee are considered to have significant influence and accounted for under the *equity method*. An investment for more than 50% of the outstanding stock of an investee is treated as a *business combination* and accounted for using *consolidated financial statements*.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe the accounting for less than 20%, 20%–50%, and greater than 50% investments.		
<ul> <li>Prepare journal entries to record the purchase of a stock investment.</li> </ul>	EE13-2	PE13-2A, 13-2B
• Prepare journal entries for the receipt of dividends.	EE13-2	PE13-2A, 13-2B
• Prepare journal entries for the sale of a stock investment at a gain or loss.	EE13-2	PE13-2A, 13-2B
• Prepare journal entries for the equity earnings of an equity method investee.	EE13-3	PE13-3A, 13-3B
• Prepare journal entries for the dividends received from an equity method investee.	EE13-3	PE13-3A, 13-3B
<ul> <li>Describe a business combination, parent company, and subsidiary company.</li> </ul>		
Describe consolidated financial statements.		



### Describe and illustrate valuing and reporting investments in the financial statements.

**Key Points** Debt and equity security investments of 20%–50% of the outstanding stock (not control) of the are classified as either (1) trading securities, (2) available-for-sale securities, and (3) held-to-maturity securities for reporting and valuation purposes. *Trading securities* are valued at *fair value*, with unrealized gains and losses reported on the income statement. *Available-for-sale securities* are reported at fair value with unrealized gains or losses reported in the Stockholders' Equity section of the balance sheet. *Held-to-maturity* investments are valued at amortized cost.

Learning Outcomes	Evamela	Dractico
<ul> <li>Describe trading securities, held-to-maturity securities, and available-for-sale securities.</li> </ul>	Example Exercises	Practice Exercises
• Prepare journal entries to record the change in the fair value of a trading security portfolio.	EE13-4	PE13-4A, 13-4B
• Describe and illustrate the reporting of trading securities on the balance sheet.		
• Prepare journal entries to record the change in fair value of an available-for-sale security portfolio.	EE13-5	PE13-5A, 13-5B
• Describe and illustrate the reporting of available-for-sale securities on the balance sheet.		
• Describe the accounting for held-to-maturity debt securities.		



### Describe fair value accounting and its effects on the financial statements.

**Key Points** There is a trend toward fair value accounting in generally accepted accounting principles. Fair value is the price that would be received to sell an asset or pay off a liability.

### **Learning Outcomes**

- · Describe fair value accounting.
- Describe how fair value accounting impacts the balance sheet and income statement.

Example Exercises Practice Exercises



### Describe and illustrate the computation of dividend yield.

**Key Points** The dividend yield measures the cash return from common dividends as a percent of the market price of the common stock. The ratio is computed as dividends per share of common stock divided by the market price per share of common stock.

### **Learning Outcomes**

- Compute dividend yield.
- Describe how dividend yield measures the return to stockholders from dividends.

Example Exercises EE13-6

Practice Exercises

6 PE13-6A, 13-6B

# **Key Terms**

accumulated other comprehensive income (604) available-for-sale securities (597) business combination (594) comprehensive income (604) consolidated financial statements (594) cost method (591)

debt securities (587) dividend yield (602) equity method (592) equity securities (587) fair value (595) held-to-maturity securities (599) investee (590)

investments (587) investor (590) other comprehensive income (604) parent company (594) subsidiary company (594) trading securities (595) unrealized gain or loss (595)

# **Illustrative Problem**

The following selected investment transactions were completed by Rosewell Company during 2016, its first year of operations:

2016

- Jan. 11. Purchased 800 shares of Bryan Company stock as an available-for-sale security at \$23 per share plus an \$80 brokerage commission.
- Feb. 6. Purchased \$40,000 of 8% U.S. Treasury bonds at their face amount plus accrued interest for 36 days. The bonds pay interest on January 1 and July 1. The bonds were classified as held-to-maturity securities.

2016

- Mar. 3. Purchased 1,900 shares of Cohen Company stock as a trading security at \$48 per share plus a \$152 brokerage commission.
- Apr. 5. Purchased 2,400 shares of Lyons Inc. stock as an available-for-sale security at \$68 per share plus a \$120 brokerage commission.
- May 12. Purchased 200,000 shares of Myers Company at \$37 per share plus an \$8,000 brokerage commission. Myers Company has 800,000 common shares issued and outstanding. The equity method was used for this investment.
- July 1. Received semiannual interest on bonds purchased on February 6.
- Aug. 29. Sold 1,200 shares of Cohen Company stock at \$61 per share less a \$90 brokerage commission.
- Oct. 5. Received an \$0.80-per-share dividend on Bryan Company stock.
- Nov. 11. Received a \$1.10-per-share dividend on Myers Company stock.
  - 16. Purchased 3,000 shares of Morningside Company stock as a trading security for \$52 per share plus a \$150 brokerage commission.
- Dec. 31. Accrued interest on U.S. Treasury bonds.
  - 31. Myers Company earned \$1,200,000 during the year. Rosewell recorded its share of Myers Company earnings, using the equity method.
  - 31. Prepared adjusting entries for the portfolios of trading and available-for-sale securities, based upon the following fair values (stock prices):

Bryan Company	\$21
Cohen Company	43
Lyons Inc.	88
Myers Company	40
Morningside Company	45

### **Instructions**

- 1. Journalize the preceding transactions.
- 2. Prepare the balance sheet disclosure for Rosewell Company's investments on December 31, 2016. Assume held-to-maturity investments are classified as noncurrent assets.

### **Solution**

1.

²⁰¹⁶ Jan.	11	Investments—Bryan Company Cash *(800 shares × \$23 per share) + \$80	18,480*	18,480	
Feb.	6	Investments—U.S. Treasury Bonds Interest Receivable Cash *\$40,000 × 8% × (36 days ÷ 360 days)	40,000 320*	40,320	
Mar.	3	Investments—Cohen Company Cash *(1,900 shares × \$48 per share) + \$152	91,352*	91,352	

2016 Apr.	5	Investments—Lyons Inc. Cash *(2,400 shares × \$68 per share) + \$120		163,320*	163,320
May	12	Investment in Myers Company Cash *(200,000 shares × \$37 per share) + \$8,000	7,	408,000*	7,408,000
July	1	Cash Interest Receivable Interest Revenue *\$40,000 × 8% × ½		1,600*	320 1,280
Aug.	29	Cash Investments—Cohen Company Gain on Sale of Investments *(1,200 shares × \$61 per share) – \$90 **1,200 shares × (\$91,352 ÷ 1,900 shares)		73,110*	57,696** 15,414
Oct.	5	Cash Dividend Revenue *800 shares × \$0.80 per share		640	640
Nov.	11	Cash Investment in Myers Company Stock *200,000 shares × \$1.10 per share		220,000	220,000
Nov.	16	Investments—Morningside Company Cash *(3,000 shares × \$52 per share) + \$150		156,150 ⁹	156,150
Dec.	31	Interest Receivable Interest Revenue $ Accrued interest, \$40,000 \times 8\% \times \frac{1}{2}. $		1,600	1,600
Dec.	31	Investment in Myers Company Stock Income of Myers Company Recorded equity income, \$1,200,000 × (200,000 shares ÷ 800,000 shares).		300,000	300,000

_	_	-
6	7	

	²⁰¹⁶ Dec.	31	Unrealized Loss on Trading Investments  Valuation Allowance for Trading Investments  Recorded decease in fair value of trading investments, \$165,100 – \$189,806.		24,706	24,706	
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Name	<b>Number of Shares</b>	<b>Total Cost</b>	Total Fair Value
Cohen Company	700	\$ 33,656	\$ 30,100*
Morningside Company	3,000	156,150	_135,000**
Total		\$189,806	\$165,100

^{*700} shares  $\times$  \$43 per share

*Note*: Myers Company is valued using the equity method; thus, the fair value is not used.

Unrealized Gain (Loss) on Available-for- Sale Investments 46,200 Recorded increase in fair value of available- for-sale investments, \$228,000 – \$181,800.
-------------------------------------------------------------------------------------------------------------------------------------------------------------

Name	Number of Shares	Total Cost	<b>Total Fair Value</b>
Bryan Company	800	\$ 18,480	\$ 16,800*
Lyons Inc.	2,400	163,320	211,200**
Total		\$181,800	\$228,000

^{*800} shares  $\times$  \$21 per share

2.

# Rosewell Company Balance Sheet (Selected) December 31, 2016

December 31, 2016		
Current assets:		
Cash		\$ XXX,XXX
Trading investments (at cost)	\$189,806	
Less valuation allowance for trading investments	24,706	
Trading investments at fair value		165,100
Available-for-sale investments (at cost)	\$181,800	
Plus valuation allowance for available-for-sale investments	46,200	
Available-for-sale investments at fair value		228,000
Investments:		
Held-to-maturity investments		40,000
Investment in Myers Company (equity method)		7,488,000
Stockholders' equity:		
Common stock		\$ XX,XXX
Paid-in capital in excess of par		XXX,XXX
Retained earnings		XXX,XXX
Plus unrealized gain (loss) on available-for-sale investments		46,200
Total stockholders' equity		\$ XXX,XXX

^{**3,000} shares  $\times$  \$45 per share

^{**2,400} shares  $\times$  \$88 per share

# **Discussion Questions**

- 1. Why might a business invest cash in temporary investments?
- 2. What causes a gain or loss on the sale of a bond investment?
- 3. When is the equity method the appropriate accounting for equity investments?
- 4. How does the accounting for a dividend received differ between the cost method and the equity method?
- 5. If an investor owns more than 50% of an investee, how is the investment treated on the investor's financial statements?
- 6. What is the major difference in the accounting for a portfolio of trading securities and a portfolio of available-for-sale securities?

- 7. If Valuation Allowance for Available-for-Sale Investments has a credit balance, how is it treated on the balance sheet?
- 8. How would a debit balance in Unrealized Gain (Loss) on Available-for-Sale Investments be reported in the financial statements?
- 9. What are the factors contributing to the trend toward fair value accounting?
- 10. How are the balance sheet and income statement affected by fair value accounting?

# **Practice Exercises**

**EE 13-1** p. 590

### PE 13-1A Bond investment transactions

OBJ. 2

Journalize the entries to record the following selected bond investment transactions for Hall Trust:

- a. Purchased for cash \$300,000 of Oates City 4% bonds at 100 plus accrued interest of \$3,000.
- b. Received first semiannual interest payment.
- c. Sold \$150,000 of the bonds at 97 plus accrued interest of \$500.

**EE 13-1** p. 590

### PE 13-1B Bond investment transactions

OBJ. 2

Journalize the entries to record the following selected bond investment transactions for Starks Products:

- a. Purchased for cash \$120,000 of Iceline, Inc. 5% bonds at 100 plus accrued interest of \$1,000.
- b. Received first semiannual interest payment.
- c. Sold \$60,000 of the bonds at 101 plus accrued interest of \$500.

**EE 13-2** *p. 592* 

**EE 13-2** p. 592

### PE 13-2A Stock investment transactions

OBJ. 3

On February 10, 15,000 shares of Sting Company are acquired at a price of \$25 per share plus a \$150 brokerage commission. On April 12, a \$0.40-per-share dividend was received on the Sting Company stock. On May 29, 6,000 shares of the Sting Company stock were sold for \$32 per share less a \$120 brokerage commission. Prepare the journal entries for the original purchase, the dividend, and the sale under the cost method.

### PE 13-2B Stock investment transactions

OBJ. 3

On September 12, 2,000 shares of Aspen Company are acquired at a price of \$50 per share plus a \$200 brokerage commission. On October 15, a \$0.50-per-share dividend was received on the Aspen Company stock. On November 10, 1,200 shares of the Aspen Company stock were sold for \$42 per share less a \$150 brokerage commission. Prepare the journal entries for the original purchase, the dividend, and the sale under the cost method.



ME HOW

### **EE 13-3** *p. 594* **PE 13-3A** Equity method

OBJ. 3



On January 2, Peyroux Company acquired 35% of the outstanding stock of Gruden Company for \$625,000. For the year ended December 31, Gruden Company earned income of \$110,000 and paid dividends of \$26,000. Prepare the entries for Peyroux Company for the purchase of the stock, the share of Gruden income, and the dividends received from Gruden Company.

### **EE 13-3** p. 594

### PE 13-3B Equity method

OBJ. 3



On January 2, Yorkshire Company acquired 40% of the outstanding stock of Fain Company for \$500,000. For the year ended December 31, Fain Company earned income of \$140,000 and paid dividends of \$50,000. Prepare the entries for Yorkshire Company for the purchase of the stock, the share of Fain income, and the dividends received from Fain Company.

### **EE 13-4** p. 596

### PE 13-4A Valuing trading securities at fair value

OBJ. 4



On January 1, 2016, Valuation Allowance for Trading Investments had a zero balance. On December 31, 2016, the cost of the trading securities portfolio was \$385,000, and the fair value was \$357,400. Prepare the December 31, 2016, adjusting journal entry to record the unrealized gain or loss on trading investments.

### **EE 13-4** *p. 596*

### PE 13-4B Valuing trading securities at fair value

OBJ. 4



On January 1, 2016, Valuation Allowance for Trading Investments had a zero balance. On December 31, 2016, the cost of the trading securities portfolio was \$41,500, and the fair value was \$46,300. Prepare the December 31, 2016, adjusting journal entry to record the unrealized gain or loss on trading investments.

### **EE 13-5** p. 599

### PE 13-5A Valuing available-for-sale securities at fair value

OBJ. 4



On January 1, 2016, Valuation Allowance for Available-for-Sale Investments had a zero balance. On December 31, 2016, the cost of the available-for-sale securities was \$78,400, and the fair value was \$72,600. Prepare the adjusting entry to record the unrealized gain or loss on available-for-sale investments on December 31, 2016.

### **EE 13-5** p. 599

### PE 13-5B Valuing available-for-sale securities at fair value

**OBJ. 4** 



On January 1, 2016, Valuation Allowance for Available-for-Sale Investments had a zero balance. On December 31, 2016, the cost of the available-for-sale securities was \$24,260, and the fair value was \$26,350. Prepare the adjusting entry to record the unrealized gain or loss on available-for-sale investments on December 31, 2016.

### **EE 13-6** *p. 603*

### PE 13-6A Dividend yield

OBJ. 6





On June 30, 2016, Setzer Corporation had a market price of \$100 per share of common stock. For the previous year, Setzer paid an annual dividend of \$4.00. Compute the dividend yield for Setzer Corporation.

### **EE 13-6** p. 603

### PE 13-6B Dividend yield

OBJ. 6





On October 23, 2016, Wilkerson Company had a market price of \$40 per share of common stock. For the previous year, Wilkerson paid an annual dividend of \$1.20. Compute the dividend yield for Wilkerson Company.

# Exercises



### EX 13-1 Entries for investment in bonds, interest, and sale of bonds

OBJ. 2

Parilo Company acquired \$170,000 of Makofske Co., 5% bonds on May 1, 2016, at their face amount. Interest is paid semiannually on May 1 and November 1. On November 1, 2016, Parilo Company sold \$50,000 of the bonds for 96.

Journalize entries to record the following:

- a. The initial acquisition of the bonds on May 1.
- b. The semiannual interest received on November 1.

OBJ. 2

- c. The sale of the bonds on November 1.
- d. The accrual of \$1,000 interest on December 31, 2016.

### EX 13-2 Entries for investments in bonds, interest, and sale of bonds



Kalyagin Investments acquired \$220,000 of Jerris Corp., 7% bonds at their face amount on October 1, 2016. The bonds pay interest on October 1 and April 1. On April 1, 2017, Kalyagin sold \$80,000 of Jerris Corp. bonds at 103.

Journalize the entries to record the following:

- a. The initial acquisition of the Jerris Corp. bonds on October 1, 2016.
- b. The adjusting entry for three months of accrued interest earned on the Jerris Corp. bonds on December 31, 2016.
- c. The receipt of semiannual interest on April 1, 2017.
- d. The sale of \$80,000 of Jerris Corp. bonds on April 1, 2017, at 103.

### EX 13-3 Entries for investment in bonds, interest, and sale of bonds

OBJ. 2

✓ Oct. 31, Loss on sale of investments, \$400



Bocelli Co. purchased \$120,000 of 6%, 20-year Sanz County bonds on May 11, 2016, directly from the county, at their face amount plus accrued interest. The bonds pay semiannual interest on April 1 and October 1. On October 31, 2016, Bocelli Co. sold \$30,000 of the Sanz County bonds at 99 plus \$150 accrued interest, less a \$100 brokerage commission.

Provide journal entries for the following:

- a. The purchase of the bonds on May 11, plus 40 days of accrued interest.
- b. Semiannual interest on October 1.
- c. Sale of the bonds on October 31.
- d. Adjusting entry for accrued interest of \$1,365 on December 31, 2016.

### EX 13-4 Entries for investment in bonds, interest, and sale of bonds

OBJ. 2

The following bond investment transactions were completed during 2016 by Starks Company:

✓ Aug. 29, Loss on sale of investments, \$700



- Jan. 31. Purchased 75, \$1,000 government bonds at 100 plus 30 days' accrued interest. The bonds pay 6% annual interest on July 1 and January 1.
- July 1. Received semiannual interest on bond investment.

Aug. 29. Sold 35, \$1,000 bonds at 98 plus \$350 accrued interest.

- a. Journalize the entries for these transactions.
- b. Provide the December 31, 2016, adjusting journal entry for semiannual interest earned on the bonds.

### EX 13-5 Interest on bond investments

OBJ. 2

On April 1, 2016, Rizzo Company purchased \$80,000 of 4.5%, 20-year Energizer Company bonds at their face amount plus one month's accrued interest. The bonds pay interest on March 1 and September 1. On November 1, 2016, Rizzo Company sold \$30,000 of the Energizer Company bonds acquired on April 1, plus two months' accrued interest. On December 31, 2016, four months' interest was accrued for the remaining bonds.

Determine the interest earned by Rizzo Company on Energizer Company bonds for 2016.

# ✓ c. Gain on sale of investments, \$17,755



### EX 13-6 Entries for investment in stock, receipt of dividends, and sale of shares OBJ.

On March 4, Breen Corporation acquired 7,500 shares of the 200,000 outstanding shares of Melton Co. common stock at \$40 plus commission charges of \$175. On June 15, a cash dividend of \$2.10 per share was received. On October 12, 3,000 shares were sold at \$46, less commission charges of \$175.

Using the cost method, journalize the entries for (a) the purchase of stock, (b) the receipt of dividends, and (c) the sale of 3,000 shares.

# ✓ June 17, Loss on sale of investments, \$8,515



### The following o

EX 13-7 Entries for investment in stock, receipt of dividends, and sale of shares

OBJ. 3

The following equity investment transactions were completed by Chung Company in 2016:

- Mar. 4. Purchased 4,000 shares of Jas Company for a price of \$50 per share plus a brokerage commission of \$100.
- May 12. Received a quarterly dividend of \$0.75 per share on the Jas Company investment.
- June 17. Sold 1,400 shares for a price of \$44 per share less a brokerage commission of \$80.

Journalize the entries for these transactions.

### EX 13-8 Entries for stock investments, dividends, and sale of stock

OBJ. 3

Yerbury Corp. manufactures construction equipment. Journalize the entries to record the following selected equity investment transactions completed by Yerbury during 2016:

- Feb. 2. Purchased for cash 5,300 shares of Wong Inc. stock for \$20 per share plus a \$110 brokerage commission.
- Mar. 6. Received dividends of \$0.30 per share on Wong Inc. stock.
- June 7. Purchased 2,000 shares of Wong Inc. stock for \$26 per share plus a \$120 brokerage commission.
- July 26. Sold 6,000 shares of Wong Inc. stock for \$35 per share less a \$100 brokerage commission. Yerbury assumes that the first investments purchased are the first investments sold.
- Sept. 25. Received dividends of \$0.40 per share on Wong Inc. stock.

### EX 13-9 Entries for stock investments, dividends, and sale of stock

OBJ. 3

Seamus Industries Inc. buys and sells investments as part of its ongoing cash management. The following investment transactions were completed during the year:

- Feb. 24. Acquired 1,000 shares of Tett Co. stock for \$85 per share plus a \$150 brokerage commission.
- May 16. Acquired 2,500 shares of Issacson Co. stock for \$36 per share plus a \$100 commission.
- July 14. Sold 400 shares of Tett Co. stock for \$100 per share less a \$75 brokerage commission.
- Aug. 12. Sold 750 shares of Issacson Co. stock for \$32.50 per share less an \$80 brokerage commission.
- Oct. 31. Received dividends of \$0.40 per share on Tett Co. stock.

Journalize the entries for these transactions.

### EX 13-10 Equity method for stock investment

OBJ. 3

At a total cost of \$6,300,000, Veravo Corporation acquired 210,000 shares of Strado Corp. common stock as a long-term investment. Veravo Corporation uses the equity method of accounting for this investment. Strado Corp. has 700,000 shares of common stock outstanding, including the shares acquired by Veravo Corporation.

- a. Journalize the entries by Veravo Corporation to record the following information:
  - 1. Strado Corp. reports net income of \$860,000 for the current period.
  - 2. A cash dividend of \$0.32 per common share is paid by Strado Corp. during the current period.
- b. Why is the equity method appropriate for the Strado Corp. investment?

✓ Sept. 25, Dividend revenue, \$520







#### √ b. \$5,400,500





#### EX 13-11 Equity method for stock investment

OBJ. 3

On January 4, 2016, Spandella Company purchased 175,000 shares of Filington Company directly from one of the founders for a price of \$30 per share. Filington has 500,000 shares outstanding, including the Penman shares. On July 2, 2016, Filington paid \$620,000 in total dividends to its shareholders. On December 31, 2016, Filington reported a net income of \$1,050,000 for the year. Spandella uses the equity method in accounting for its investment in Filington.

- a. Provide the Spandella Inc. journal entries for the transactions involving its investment in Filington Inc. during 2016.
- Determine the December 31, 2016, balance of the Investment in Filington Company. Stock account.

#### EX 13-12 Equity method for stock investment with loss

OBJ. 3

On January 6, 2016, Bulldog Co. purchased 34% of the outstanding stock of Gator Co. for \$212,000. Gator Co. paid total dividends of \$24,000 to all shareholders on June 30. Gator had a net loss of \$56,000 for 2016.

- a. Journalize Bulldog's purchase of the stock, receipt of the dividends, and the adjusting entry for the equity loss in Gator Co. stock.
- b. Compute the balance of Investment in Gator Co. Stock on December 31, 2016.
- c. How does valuing an investment under the equity method differ from valuing an investment at fair value?

#### **EX 13-13** Equity method for stock investment

OBJ. 3

Hawkeye Company's balance sheet reported, under the equity method, its long-term investment in Raven Company for comparative years as follows:

	Dec. 31, 2017	Dec. 31, 2016
Investment in Raven Company stock (in millions)	\$281	\$264

In addition, the 2017 Hawkeye Company income statement disclosed equity earnings in the Raven Company investment as \$25 million. Hawkeye Company neither purchased nor sold Raven Company stock during 2017. The fair value of the Raven Company stock investment on December 31, 2017, was \$310 million.

Explain the change in Investment in Raven Company Stock from December 31, 2016, to December 31, 2017.

#### EX 13-14 Missing statement items, trading investments

OBJ. 4

JED Capital Inc. makes investments in trading securities. Selected income statement items for the years ended December 31, 2016 and 2017, plus selected items from comparative balance sheets, are as follows:

JED Capital Inc. Selected Income Statement Items For the Years Ended December 31, 2016 and 2017

	2016	2017
Operating income	a.	e.
Unrealized gain (loss)	b.	\$(11,000)
Net income	c.	28,000

#### JED Capital Inc. Selected Balance Sheet Items December 31, 2015, 2016, and 2017

·			
	Dec. 31, 2015	Dec. 31, 2016	Dec. 31, 2017
Trading investments, at cost	\$144,000	\$168,000	\$205,000
Valuation allowance for trading investments	(12,000)	17,000	g.
Trading investments, at fair value	d.	f.	<u>h.</u>
Retained earnings	\$210,000	\$245,000	i.

There were no dividends.

Determine the missing lettered items.

**✓** g. \$6,000









#### EX 13-15 Fair value journal entries, trading investments

**OBJ. 3, 4** 

The investments of Charger Inc. include a single investment: 14,500 shares of Raiders Inc. common stock purchased on February 24, 2016, for \$38 per share including brokerage commission. These shares were classified as trading securities. As of the December 31, 2016, balance sheet date, the share price had increased to \$42 per share.

- a. Journalize the entries to acquire the investment on February 24, and record the adjustment to fair value on December 31, 2016.
- b. How is the unrealized gain or loss for trading investments reported on the financial statements?

#### EX 13-16 Fair value journal entries, trading investments

OBJ. 3, 4

Jets Bancorp Inc. purchased a portfolio of trading securities during 2016. The cost and fair value of this portfolio on December 31, 2016, was as follows:

Name	<b>Number of Shares</b>	<b>Total Cost</b>	<b>Total Fair Value</b>
Dolphins Inc.	1,400	\$28,000	\$30,800
Marino Company	1,200	30,000	27,600
Namath Company	800	28,000	26,400
Total		\$86,000	\$84,800

On May 10, 2017, Jets Bancorp Inc. purchased 1,000 shares of Giants Inc. at \$24 per share plus a \$150 brokerage commission.

Provide the journal entries to record the following:

- a. The adjustment of the trading security portfolio to fair value on December 31, 2016.
- b. The May 10, 2017, purchase of Giants Inc. stock.

#### **EX 13-17** Fair value journal entries, trading investments

OBJ. 3, 4

Last Unguaranteed Financial Inc. purchased the following trading securities during 2016, its first year of operations:

Name	<b>Number of Shares</b>	Cost
Arden Enterprises Inc.	5,000	\$150,000
French Broad Industries Inc.	2,750	66,000
Pisgah Construction Inc.	1,600	104,000
Total		\$320,000

The market price per share for the trading security portfolio on December 31, 2016, was as follows:

	Market Price per Share, Dec. 31, 2016
Arden Enterprises Inc.	\$34
French Broad Industries Inc.	26
Pisgah Construction Inc.	60

- a. Provide the journal entry to adjust the trading security portfolio to fair value on December 31, 2016.
- b. Assume the market prices of the portfolio were the same on December 31, 2017, as they were on December 31, 2016. What would be the journal entry to adjust the portfolio to fair value?

#### EX 13-18 Balance sheet presentation, trading investments

**OBJ.** 4

The income statement for Delta-tec Inc. for the year ended December 31, 2016, was as follows:

# Delta-tec Inc. Income Statement (selected items) For the Year Ended December 31, 2016

Income from operations	\$299,700
Gain on sale of investments	17,800
Less unrealized loss on trading investments	72,500
Net income	\$245,000

The balance sheet dated December 31, 2015, showed a Retained Earnings balance of \$825,000. During 2016, the company purchased trading investments for the first time at a cost of \$346,000. In addition, trading investments with a cost of \$66,000 were sold at a gain during 2016. The company paid \$65,000 in dividends during 2016.

- a. Determine the December 31, 2016, Retained Earnings balance.
- b. Provide the December 31, 2016, balance sheet presentation for Trading Investments.

#### EX 13-19 Missing statement items, available-for-sale securities

OBJ. 4

Highland Industries Inc. makes investments in available-for-sale securities. Selected income statement items for the years ended December 31, 2016 and 2017, plus selected items from comparative balance sheets, are as follows:

Highland Industries Inc.
Selected Income Statement Items
For the Years Ended December 31, 2016 and 2017

	•	
	2016	2017
Operating income	a.	g.
Gain (loss) from sale of investments	\$7,500	\$(12,000)
Net income (loss)	b.	(21,000)

#### Highland Industries Inc. Selected Balance Sheet Items December 31, 2015, 2016, and 2017

	Dec. 31, 2015	Dec. 31, 2016	Dec. 31, 2017
Assets			
Available-for-sale investments, at cost	\$ 90,000	\$ 86,000	\$102,000
Valuation allowance for available-for-sale investments	12,000	(11,000)	h.
Available-for-sale investments, at fair value	c.	e.	i.
Stockholders' Equity			
Unrealized gain (loss) on available-for-sale investments	d.	f.	(16,400)
Retained earnings	\$175,400	\$220,000	j.

There were no dividends.

Determine the missing lettered items.

#### EX 13-20 Fair value journal entries, available-for-sale investments

OBJ. 3, 4

The investments of Steelers Inc. include a single investment: 33,100 shares of Bengals Inc. common stock purchased on September 12, 2016, for \$13 per share including brokerage commission. These shares were classified as available-for-sale securities. As of the December 31, 2016, balance sheet date, the share price declined to \$11 per share.

- a. Journalize the entries to acquire the investment on September 12 and record the adjustment to fair value on December 31, 2016.
- b. How is the unrealized gain or loss for available-for-sale investments disclosed on the financial statements?

#### **EX 13-21** Fair value journal entries, available-for-sale investments

OBJ. 3, 4

Hurricane Inc. purchased a portfolio of available-for-sale securities in 2016, its first year of operations. The cost and fair value of this portfolio on December 31, 2016, was as follows:

Name	<b>Number of Shares</b>	<b>Total Cost</b>	Total Fair Value
Tornado Inc.	800	\$14,000	\$15,600
Tsunami Corp.	1,250	31,250	35,000
Typhoon Corp.	2,140	43,870	42,800
Total		\$89,120	\$93,400

(Continued)

✓ f. \$(11,000)

On June 12, 2017, Hurricane purchased 1,450 shares of Rogue Wave Inc. at \$45 per share plus a \$100 brokerage commission.

- a. Provide the journal entries to record the following:
  - 1. The adjustment of the available-for-sale security portfolio to fair value on December 31, 2016.
  - 2. The June 12, 2017, purchase of Rogue Wave Inc. stock.
- b. How are unrealized gains and losses treated differently for available-for-sale securities than for trading securities?

#### **EX 13-22** Fair value journal entries, available-for-sale investments

OBJ. 3. 4

Storm, Inc. purchased the following available-for-sale securities during 2016, its first year of operations:

Name	Number of Shares	Cost
Dust Devil, Inc.	1,900	\$ 81,700
Gale Co.	850	68,000
Whirlwind Co.	2,850	114,000
Total		\$263,700

The market price per share for the available-for-sale security portfolio on December 31, 2016, was as follows:

	Market Price per Share, Dec. 31, 2016
Dust Devil, Inc.	\$40
Gale Co.	75
Whirlwind Co.	42

- a. Provide the journal entry to adjust the available-for-sale security portfolio to fair value on December 31, 2016.
- b. Describe the income statement impact from the December 31, 2016, journal entry.

#### **EX 13-23** Balance sheet presentation of available-for-sale investments

OBJ. 4

During 2016, its first year of operations, Galileo Company purchased two available-forsale investments as follows:

Security	<b>Shares Purchased</b>	Cost	
Hawking Inc.	900	\$44,000	
Pavlov Co.	1.780	38.000	

Assume that as of December 31, 2016, the Hawking Inc. stock had a market value of \$50 per share, and the Pavlov Co. stock had a market value of \$24 per share. Galileo Company had net income of \$300,000, and paid no dividends for the year ended December 31, 2016. All of the available-for-sale investments are classified as current assets.

- a. Prepare the Current Assets section of the balance sheet presentation for the available-for-sale investments.
- b. Prepare the Stockholders' Equity section of the balance sheet to reflect the earnings and unrealized gain (loss) for the available-for-sale investments.

#### EX 13-24 Balance sheet presentation of available-for-sale investments

OBJ. 4

During 2016, Copernicus Corporation held a portfolio of available-for-sale securities having a cost of \$185,000. There were no purchases or sales of investments during the year. The market values at the beginning and end of the year were \$225,000 and \$160,000, respectively. The net income for 2016 was \$180,000, and no dividends were paid during the year. The Stockholders' Equity section of the balance sheet was as follows on December 31, 2015:



#### Copernicus Corporation Stockholders' Equity December 31, 2015

Common stock	\$ 50,000
Paid-in capital in excess of par	250,000
Retained earnings	340,000
Unrealized gain (loss) on available-for-sale investments	40,000
Total	\$680,000

Prepare the Stockholders' Equity section of the balance sheet for December 31, 2016.

#### EX 13-25 Dividend yield

OBJ. 6





At the market close on March 28 of a recent year, McDonald's Corporation had a closing stock price of \$99.69. In addition, McDonald's Corporation had a dividend per share of \$2.87 during the previous year.

Determine McDonald's Corporation's dividend yield. (Round to one decimal place.)

#### EX 13-26 Dividend yield

OBJ. 6

✓ a. Dec. 31, current year, 3.00%





The market price for Microsoft Corporation closed at \$26.71 and \$25.96 on December 31, current year, and previous year, respectively. The dividends per share were \$0.80 for current year and \$0.64 for previous year.

- a. Determine the dividend yield for Microsoft on December 31, current year, and previous year. (Round percentages to two decimal places.)
- b. Interpret these measures.

#### EX 13-27 Dividend yield

OBJ. 6





**eBay Inc.** developed a Web-based marketplace at www.ebay.com, in which individuals can buy and sell a variety of items. eBay also acquired **PayPal**, an online payments system that allows businesses and individuals to send and receive online payments securely. In a recent annual report, eBay published the following dividend policy:

We have never paid cash dividends on our stock and currently anticipate that we will continue to retain any future earnings for the foreseeable future.

Given eBay's dividend policy, why would an investor be attracted to its stock?

#### **Appendix**

#### EX 13-28 Comprehensive income

On May 12, 2016, Chewco Co. purchased 2,000 shares of Jedi Inc. for \$112 per share, including the brokerage commission. The Jedi investment was classified as an available-for-sale security. On December 31, 2016, the fair value of Jedi Inc. was \$124 per share. The net income of Chewco Co. was \$50,000 for 2016.

Compute the comprehensive income for Chewco Co. for the year ended December 31, 2016.

#### **Appendix**

#### EX 13-29 Comprehensive income

On December 31, 2015, Valur Co. had the following available-for-sale investment disclosure within the Current Assets section of the balance sheet:

Available-for-sale investments (at cost)	\$145,000
Plus valuation allowance for available-for-sale investments	40,000
Available-for-sale investments (at fair value)	\$185,000

There were no purchases or sales of available-for-sale investments during 2016. On December 31, 2016, the fair value of the available-for-sale investment portfolio was \$200,000. The net income of Valur Co. was \$210,000 for 2016.

Compute the comprehensive income for Valur Co. for the year ended December 31, 2016.

# **Problems: Series A**

#### General Ledger



#### PR 13-1A Debt investment transactions, available-for-sale valuation

**OBJ. 2, 4** 

Gaelic Industries Inc. is an athletic footware company that began operations on January 1, 2016. The following transactions relate to debt investments acquired by Gaelic Industries Inc., which has a fiscal year ending on December 31:

#### 2016

- May 1. Purchased \$75,000 of Avery Co. 7%, 15-year bonds at their face amount plus accrued interest of \$875. The bonds pay interest semiannually on March 1 and September 1.
  - 16. Purchased \$60,000 of Clawhammer 6%, 10-year bonds at their face amount plus accrued interest of \$150. The bonds pay interest semiannually on May 1 and November 1.
- Sept. 1. Received semiannual interest on the Avery Co. bonds.
  - 30. Sold \$30,000 of Avery Co. bonds at 98 plus accrued interest of \$175.
- Nov. 1. Received semiannual interest on the Clawhammer bonds.
- Dec. 31. Accrued \$1,050 interest on the Avery Co. bonds.
  - 31. Accrued \$600 interest on the Clawhammer bonds.

#### 2017

- Mar. 1. Received semiannual interest on the Avery Co. bonds.
- May 1. Received semiannual interest on the Clawhammer bonds.

#### **Instructions**

- 1. Journalize the entries to record these transactions.
- 2. If the bond portfolio is classified as available for sale, what impact would this have on financial statement disclosure?

#### PR 13-2A Stock investment transactions, trading securities

OBJ. 3, 4

Scofield Financial Co. is a regional insurance company that began operations on January 1, 2016. The following transactions relate to trading securities acquired by Scofield Financial Co., which has a fiscal year ending on December 31:

#### 2016

- Mar. 14. Purchased 5,000 shares of Wilkomm Inc. as a trading security at \$40 per share plus a brokerage commission of \$500.
- Apr. 24. Purchased 1,800 shares of McMarsh Inc. as a trading security at \$50 plus a brokerage commission of \$198.
- June 1. Sold 2,600 shares of Wilkomm Inc. for \$38 per share less a \$100 brokerage commission.
  - 30. Received an annual dividend of \$0.35 per share on Wilkomm Inc. stock.
- Dec. 31. The portfolio of trading securities was adjusted to fair values of \$38 and \$49 per share for Wilkomm Inc. and McMarsh Inc., respectively.

#### 2017

- Apr. 4. Purchased 3,500 shares of Daley Inc. as a trading security at \$30 per share plus a \$175 brokerage commission.
- June 28. Received an annual dividend of \$0.40 per share on Wilkomm Inc. stock.
- Sept. 9. Sold 700 shares of Daley Inc. for \$32 per share less a \$50 brokerage commission.
- Dec. 31. The portfolio of trading securities had a cost of \$270,578 and a fair value of \$350,000, requiring a debit balance in Valuation Allowance for Trading Investments of \$79,422 (\$350,000 \$270,578). Thus, the credit balance from December 31, 2016, is to be adjusted to the new balance.



#### Instructions

- 1. Journalize the entries to record these transactions.
- 2. Prepare the investment-related current asset balance sheet presentation for Scofield Financial Co. on December 31, 2017.
- 3. How are unrealized gains or losses on trading investments presented in the financial statements of Scofield Financial Co.?

# PR 13-3A Stock investment transactions, equity method and available-for-sale OBJ. 3, 4 securities

Forte Inc. produces and sells theater set designs and costumes. The company began operations on January 1, 2016. The following transactions relate to securities acquired by Forte Inc., which has a fiscal year ending on December 31:

#### 2016

- Jan. 22. Purchased 22,000 shares of Sankal Inc. as an available-for-sale security at \$18 per share, including the brokerage commission.
- Mar. 8. Received a cash dividend of \$0.22 per share on Sankal Inc. stock.
- Sept. 8. A cash dividend of \$0.25 per share was received on the Sankal stock.
- Oct. 17. Sold 3,000 shares of Sankal Inc. stock at \$16 per share, less a brokerage commission of \$75.
- Dec. 31. Sankal Inc. is classified as an available-for-sale investment and is adjusted to a fair value of \$25 per share. Use the valuation allowance for available-for-sale investments account in making the adjustment.

#### 2017

- Jan. 10. Purchased an influential interest in Imboden Inc. for \$720,000 by purchasing 96,000 shares directly from the estate of the founder of Imboden Inc. There are 300,000 shares of Imboden Inc. stock outstanding.
- Mar. 10. Received a cash dividend of \$0.30 per share on Sankal Inc. stock.
- Sept.12. Received a cash dividend of \$0.25 per share plus an extra dividend of \$0.05 per share on Sankal Inc. stock.
- Dec. 31. Received \$57,600 of cash dividends on Imboden Inc. stock. Imboden Inc. reported net income of \$450,000 in 2017. Forte Inc. uses the equity method of accounting for its investment in Imboden Inc.
  - 31. Sankal Inc. is classified as an available-for-sale investment and is adjusted to a fair value of \$22 per share. Use the valuation allowance for available-for-sale investments account in making the adjustment for the decrease in fair value from \$25 to \$22 per share.

#### **Instructions**

- 1. Journalize the entries to record these transactions.
- 2. Prepare the investment-related asset and stockholders' equity balance sheet presentation for Forte Inc. on December 31, 2017, assuming the Retained Earnings balance on December 31, 2017, is \$389,000.

#### PR 13-4A Investment reporting

OBJ. 2, 3, 4

O'Brien Industries Inc. is a book publisher. The comparative unclassified balance sheets for December 31, 2017 and 2016 follow. Selected missing balances are shown by letters.

(Continued)



√ h. \$(5,800)



#### O'Brien Industries Inc. Balance Sheet December 31, 2017 and 2016

	Dec. 31, 2017	Dec. 31, 2016
Cash	\$233,000	\$220,000
Accounts receivable (net)	136,530	138,000
Available-for-sale investments (at cost)—Note 1	a.	103,770
Less valuation allowance for available-for-sale investments	b	2,500
Available-for-sale investments (fair value)	\$ c.	\$101,270
Interest receivable	\$ d.	
Investment in Jolly Roger Co. stock—Note 2	e.	\$ 77,000
Office equipment (net)	_115,000	_130,000
Total assets	\$ f.	\$666,270
Accounts payable	\$ 69,400	\$ 65,000
Common stock	70,000	70,000
Excess of issue price over par	225,000	225,000
Retained earnings	g.	308,770
Unrealized gain (loss) on available-for-sale investments	h	(2,500)
Total liabilities and stockholders' equity	\$ i.	\$666,270

Note 1. Investments are classified as available for sale. The investments at cost and fair value on December 31, 2016, are as follows:

	No. of Shares	Cost per Share	<b>Total Cost</b>	<b>Total Fair Value</b>
Bernard Co. stock	2,250	\$17	\$ 38,250	\$ 37,500
Chadwick Co. stock	1,260	52	65,520	63,770
			\$103,770	\$101,270

Note 2. The investment in Jolly Roger Co. stock is an equity method investment representing 30% of the outstanding shares of Jolly Roger Co.

The following selected investment transactions occurred during 2017:

- May 5. Purchased 3,080 shares of Gozar Inc. at \$30 per share including brokerage commission. Gozar Inc. is classified as an available-for-sale security.
- Oct. 1. Purchased \$40,000 of Nightline Co. 6%, 10-year bonds at 100. The bonds are classified as available for sale. The bonds pay interest on October 1 and April 1.
  - 9. Dividends of \$12,500 are received on the Jolly Roger Co. investment.
- Dec. 31. Jolly Roger Co. reported a total net income of \$112,000 for 2017. O'Brien Industries Inc. recorded equity earnings for its share of Jolly Roger Co. net income.
  - 31. Accrued three months of interest on the Nightline bonds.
  - 31. Adjusted the available-for-sale investment portfolio to fair value, using the following fair value per-share amounts:

Available-for-Sale	
Investments	Fair Value
Bernard Co. stock	\$15.40 per share
Chadwick Co. stock	\$46.00 per share
Gozar Inc. stock	\$32.00 per share
Nightline Co. bonds	\$98 per \$100 of face amount

31. Closed the O'Brien Industries Inc. net income of \$146,230. O'Brien Industries Inc. paid no dividends during the year.

#### **Instructions**

Determine the missing letters in the unclassified balance sheet. Provide appropriate supporting calculations.

# **Problems: Series B**

General Ledger



#### PR 13-1B Debt investment transactions, available-for-sale valuation

OBJ. 2, 4

Rekya Mart Inc. is a general merchandise retail company that began operations on January 1, 2016. The following transactions relate to debt investments acquired by Rekya Mart Inc., which has a fiscal year ending on December 31:

2016

- Apr. 1. Purchased \$90,000 of Smoke Bay 6%, 10-year bonds at their face amount plus accrued interest of \$900. The bonds pay interest semiannually on February 1 and August 1.
- May 16. Purchased \$42,000 of Geotherma Co. 4%, 12-year bonds at their face amount plus accrued interest of \$70. The bonds pay interest semiannually on May 1 and November 1.
- Aug. 1. Received semiannual interest on the Smoke Bay bonds.
- Sept. 1. Sold \$12,000 of Smoke Bay bonds at 101 plus accrued interest of \$60.
- Nov. 1. Received semiannual interest on the Geotherma Co. bonds.
- Dec. 31. Accrued \$1,950 interest on the Smoke Bay bonds.
  - 31. Accrued \$280 interest on the Geotherma Co. bonds.

2017

- Feb. 1. Received semiannual interest on the Smoke Bay bonds.
- May 1. Received semiannual interest on the Geotherma Co. bonds.

#### Instructions

- 1. Journalize the entries to record these transactions.
- 2. If the bond portfolio is classified as available for sale, what impact would this have on financial statement disclosure?

#### PR 13-2B Stock investment transactions, trading securities

OBJ. 3, 4

Zeus Investments Inc. is a regional investment company that began operations on January 1, 2016. The following transactions relate to trading securities acquired by Zeus Investments Inc., which has a fiscal year ending on December 31:

2016

- Feb. 14. Purchased 4,800 shares of Apollo Inc. as a trading security at \$26 per share plus a brokerage commission of \$192.
- Apr. 1. Purchased 2,300 shares of Ares Inc. as a trading security at \$19 per share plus a brokerage commission of \$92.
- June 1. Sold 600 shares of Apollo Inc. for \$32 per share less a \$100 brokerage commission.
  - 27. Received an annual dividend of \$0.20 per share on Apollo Inc. stock.
- Dec. 31. The portfolio of trading securities was adjusted to fair values of \$33 and \$18.50 per share for Apollo Inc. and Ares Inc., respectively.

2017

- Mar. 14. Purchased 1,200 shares of Athena Inc. as a trading security at \$65 per share plus a \$120 brokerage commission.
- June 26. Received an annual dividend of \$0.21 per share on Apollo Inc. stock.
- July 30. Sold 480 shares of Athena Inc. for \$60 per share less a \$50 brokerage commission.
- Dec. 31. The portfolio of trading securities had a cost of \$200,032 and a fair value of \$188,000, requiring a credit balance in Valuation Allowance for Trading Investments of \$12,032 (\$200,032 \$188,000). Thus, the debit balance from December 31, 2014, is to be adjusted to the new balance.

#### **Instructions**

- 1. Journalize the entries to record these transactions.
- 2. Prepare the investment-related current asset balance sheet presentation for Zeus Investments Inc. on December 31, 2017.
- 3. How are unrealized gains or losses on trading investments presented in the financial statements of Zeus Investments Inc.?



# X

# PR 13-3B Stock investment transactions, equity method and available-for-sale OBJ. 3, 4 securities

Glacier Products Inc. is a wholesaler of rock climbing gear. The company began operations on January 1, 2016. The following transactions relate to securities acquired by Glacier Products Inc., which has a fiscal year ending on December 31:

2016

- Jan. 18. Purchased 9,000 shares of Malmo Inc. as an available-for-sale investment at \$40 per share, including the brokerage commission.
- July 22. A cash dividend of \$3.00 per share was received on the Malmo stock.
- Oct. 5. Sold 500 shares of Malmo Inc. stock at \$58.00 per share, less a brokerage commission of \$100.
- Dec. 18. Received a regular cash dividend of \$3.00 per share on Malmo Inc. stock.
  - 31. Malmo Inc. is classified as an available-for-sale investment and is adjusted to a fair value of \$36.00 per share. Use the valuation allowance for available-for-sale investments account in making the adjustment.

2017

- Jan. 25. Purchased an influential interest in Helsi Co. for \$800,000 by purchasing 75,000 shares directly from the estate of the founder of Helsi. There are 250,000 shares of Helsi Co. stock outstanding.
- July 16. Received a cash dividend of \$3.00 per share on Malmo Inc. stock.
- Dec. 16. Received a cash dividend of \$3.00 per share plus an extra dividend of \$0.20 per share on Malmo Inc. stock.
  - 31. Received \$38,000 of cash dividends on Helsi Co. stock. Helsi Co. reported net income of \$170,000 in 2015. Glacier Products Inc. uses the equity method of accounting for its investment in Helsi Co.
  - 31. Malmo Inc. is classified as an available-for-sale investment and is adjusted to a fair value of \$44 per share. Use the valuation allowance for available-for-sale investments account in making the adjustment for the increase in fair value from \$36 to \$44 per share.

#### **Instructions**

- 1. Journalize the entries to record the preceding transactions.
- 2. Prepare the investment-related asset and stockholders' equity balance sheet presentation for Glacier Products Inc. on December 31, 2017, assuming the Retained Earnings balance on December 31, 2017, is \$700,000.

#### PR 13-4B Investment reporting

OBJ. 2, 3, 4

Teasdale Inc. manufactures and sells commercial and residential security equipment. The comparative unclassified balance sheets for December 31, 2017 and 2016 are provided below. Selected missing balances are shown by letters.

#### Teasdale Inc. Balance Sheet December 31, 2017 and 2016

	Dec. 31, 2017	Dec. 31, 2016
Cash	\$160,000	\$156,000
Accounts receivable (net)	115,000	108,000
Available-for-sale investments (at cost)—Note 1	a.	91,200
Plus valuation allowance for available-for-sale investments	b	8,776
Available-for-sale investments (fair value)	\$ c.	\$ 99,976
Interest receivable	\$ d.	
Investment in Wright Co. stock—Note 2	e.	\$ 69,200
Office equipment (net)	96,000	105,000
Total assets	\$ f.	\$538,176
Accounts payable	\$ 91,000	\$ 72,000
Common stock	80,000	80,000
Excess of issue price over par	250,000	250,000
Retained earnings	g.	127,400
Unrealized gain (loss) on available-for-sale investments	h	8,776
Total liabilities and stockholders' equity	\$ i.	\$538,176

**✓** b. \$4,680



Note 1. Investments are classified as available for sale. The investments at cost and fair value on December 31, 2016, are as follows:

	No. of Shares	Cost per Share	<b>Total Cost</b>	<b>Total Fair Value</b>
Alvarez Inc. stock	960	\$38.00	\$36,480	\$39,936
Hirsch Inc. stock	1,900	28.80	_54,720	60,040
			\$91,200	\$99,976

Note 2. The Investment in Wright Co. stock is an equity method investment representing 30% of the outstanding shares of Wright Co.

The following selected investment transactions occurred during 2017:

- Mar. 18. Purchased 800 shares of Richter Inc. at \$40 including brokerage commission. Richter is classified as an available-for-sale security.
- July 12. Dividends of \$12,000 are received on the Wright Co. investment.
- Oct. 1. Purchased \$24,000 of Toon Co. 4%, 10-year bonds at 100. The bonds are classified as available for sale. The bonds pay interest on October 1 and April 1.
- Dec. 31. Wright Co. reported a total net income of \$80,000 for 2017. Teasdale recorded equity earnings for its share of Wright Co. net income.
  - 31. Accrued interest for three months on the Toon Co. bonds purchased on October 1.
  - 31. Adjusted the available-for-sale investment portfolio to fair value, using the following fair value per-share amounts:

Available-for-Sale Investments	Fair Value
Alvarez Inc. stock	\$41.50 per share
Hirsch Inc. stock	\$26.00 per share
Richter Inc. stock	\$48.00 per share
Toon Co. bonds	101 per \$100 of face amount

31. Closed the Teasdale Inc. net income of \$51,240. Teasdale Inc. paid no dividends during the year.

#### Instructions

Determine the missing letters in the unclassified balance sheet. Provide appropriate supporting calculations.

# **Comprehensive Problem 4**

#### General Ledger

Selected transactions completed by Equinox Products Inc. during the fiscal year ended December 31, 2016, were as follows:

- a. Issued 15,000 shares of \$20 par common stock at \$30, receiving cash.
- b. Issued 4,000 shares of \$80 par preferred 5% stock at \$100, receiving cash.
- c. Issued \$500,000 of 10-year, 5% bonds at 104, with interest payable semiannually.
- d. Declared a quarterly dividend of \$0.50 per share on common stock and \$1.00 per share on preferred stock. On the date of record, 100,000 shares of common stock were outstanding, no treasury shares were held, and 20,000 shares of preferred stock were outstanding.
- e. Paid the cash dividends declared in (d).
- f. Purchased 7,500 shares of Solstice Corp. at \$40 per share, plus a \$150 brokerage commission. The investment is classified as an available-for-sale investment.
- g. Purchased 8,000 shares of treasury common stock at \$33 per share.
- h. Purchased 40,000 shares of Pinkberry Co. stock directly from the founders for \$24 per share. Pinkberry has 125,000 shares issued and outstanding. Equinox Products Inc. treated the investment as an equity method investment.
- i. Declared a \$1.00 quarterly cash dividend per share on preferred stock. On the date of record, 20,000 shares of preferred stock had been issued.

(Continued)

- j. Paid the cash dividends to the preferred stockholders.
- k. Received \$27,500 dividend from Pinkberry Co. investment in (h).
- l. Purchased \$90,000 of Dream Inc. 10-year, 5% bonds, directly from the issuing company, at their face amount plus accrued interest of \$375. The bonds are classified as a held-to-maturity long-term investment.
- m. Sold, at \$38 per share, 2,600 shares of treasury common stock purchased in (g).
- n. Received a dividend of \$0.60 per share from the Solstice Corp. investment in (f).
- o. Sold 1,000 shares of Solstice Corp. at \$45, including commission.
- p. Recorded the payment of semiannual interest on the bonds issued in (c) and the amortization of the premium for six months. The amortization is determined using the straight-line method.
- q. Accrued interest for three months on the Dream Inc. bonds purchased in (l).
- r. Pinkberry Co. recorded total earnings of \$240,000. Equinox Products recorded equity earnings for its share of Pinkberry Co. net income.
- s. The fair value for Solstice Corp. stock was \$39.02 per share on December 31, 2016. The investment is adjusted to fair value, using a valuation allowance account. Assume Valuation Allowance for Available-for-Sale Investments had a beginning balance of zero.

#### **Instructions**

- 1. Journalize the selected transactions.
- 2. After all of the transactions for the year ended December 31, 2016, had been posted [including the transactions recorded in part (1) and all adjusting entries], the data that follows were taken from the records of Equinox Products Inc.
  - a. Prepare a multiple-step income statement for the year ended December 31, 2016, concluding with earnings per share. In computing earnings per share, assume that the average number of common shares outstanding was 100,000 and preferred dividends were \$100,000. (Round earnings per share to the nearest cent.)
  - b. Prepare a retained earnings statement for the year ended December 31, 2016.
  - c. Prepare a balance sheet in report form as of December 31, 2016.

Income statement data:	
Advertising expense	\$ 150,000
Cost of merchandise sold	3,700,000
Delivery expense	30,000
Depreciation expense—office buildings and equipment	30,000
Depreciation expense—store buildings and equipment	100,000
Dividend revenue	4,500
Gain on sale of investment	4,980
Income from Pinkberry Co. investment	76,800
Income tax expense	140,500
Interest expense	21,000
Interest revenue	2,720
Miscellaneous administrative expense	7,500
Miscellaneous selling expense	14,000
Office rent expense	50,000
Office salaries expense	170,000
Office supplies expense	10,000
Sales	5,254,000
Sales commissions	185,000
Sales salaries expense	385,000
Store supplies expense	21,000
Retained earnings and balance sheet data:	
Accounts payable	\$ 194,300
Accounts receivable	545,000
Accumulated depreciation—office buildings and equipment	1,580,000
Accumulated depreciation—store buildings and equipment	4,126,000
Allowance for doubtful accounts	8,450

Available-for-sale investments (at cost)	\$	260,130
Bonds payable, 5%, due 2024		500,000
Cash		246,000
Common stock, \$20 par (400,000 shares authorized; 100,000 shares issued, 94,600 outstanding)		2,000,000
Dividends:		
Cash dividends for common stock		155,120
Cash dividends for preferred stock		100,000
Goodwill		500,000
Income tax payable		44,000
Interest receivable		1,125
Investment in Pinkberry Co. stock (equity method)		1,009,300
Investment in Dream Inc. bonds (long term)		90,000
Merchandise inventory (December 31, 2016), at lower		
of cost (FIFO) or market		778,000
Office buildings and equipment		4,320,000
Paid-in capital from sale of treasury stock		13,000
Excess of issue price over par—common stock		886,800
Excess of issue price over par—preferred stock		150,000
Preferred 5% stock, \$80 par (30,000 shares authorized;		
20,000 shares issued)		1,600,000
Premium on bonds payable		19,000
Prepaid expenses		27,400
Retained earnings, January 1, 2016		9,319,725
Store buildings and equipment	1	2,560,000
Treasury stock (5,400 shares of common stock at cost of		
\$33 per share)		178,200
Unrealized gain (loss) on available-for-sale investments		(6,500)
Valuation allowance for available-for-sale investments		(6,500)

# **Cases & Projects**

#### CP 13-1 Benefits of fair value

On July 16, 1998, Wyatt Corp. purchased 40 acres of land for \$350,000. The land has been held for a future plant site until the current date, December 31, 2016. On December 18, 2016, TexoPete Inc. purchased 40 acres of land for \$2,000,000 to be used for a distribution center. The TexoPete land is located next to the Wyatt Corp. land. Thus, both Wyatt Corp. and TexoPete Inc. own nearly identical pieces of land.

- 1. What are the valuations of land on the balance sheets of Wyatt Corp. and TexoPete Inc. using generally accepted accounting principles?
- 2. How might fair value accounting aid comparability when evaluating these two companies?

#### CP 13-2 International fair value accounting

International Financial Reporting Standard No. 16 provides companies the option of valuing property, plant, and equipment at either historical cost or fair value. If fair value is selected, then the property, plant, and equipment must be revalued periodically to fair value. Under fair value, if there is an increase in the value of the property, plant, and equipment during the reporting period, then the increase is credited to stockholders' equity. However, if there is a decrease in fair value, then the decrease is reported as an expense for the period.

How is the international accounting treatment for changes in fair value for property, plant, and equipment similar to investments?







#### **CP 13-3** Ethics and fair value measurement

Financial assets include stocks and bonds. These are fairly simple securities that can often be valued using quoted market prices. However, there are more complex financial instruments that do not have quoted market prices. These complex securities must still be valued on the balance sheet at fair value. Generally accepted accounting principles require that the reporting entity use assumptions in valuing investments when market prices or critical valuation inputs are unobservable.

What are the ethical considerations in making subjective valuations of these complex financial instruments?

#### CP 13-4 Warren Buffett and "look-through" earnings

**Berkshire Hathaway**, the investment holding company of Warren Buffett, reports its "less than 20% ownership" investments according to generally accepted accounting principles. However, it also provides additional disclosures that it terms "look-through" earnings.

#### Warren Buffett states,

Many of these companies (in the less than 20%-owned category) pay out relatively small proportions of their earnings in dividends. This means that only a small proportion of their earning power is recorded in our own current operating earnings. But, while our reported operating earnings reflect only the dividends received from such companies, our economic well-being is determined by their earnings, not their dividends.

The value to Berkshire Hathaway of retained earnings (of our investees) is not determined by whether we own 100%, 50%, 20%, or 1% of the businesses in which they reside.... Our perspective on such "forgotten-but-not-gone" earnings is simple: the way they are accounted for is of no importance, but their ownership and subsequent utilization is all-important. We care not whether the auditors hear a tree fall in the forest; we do care who owns the tree and what's next done with it

I believe the best way to think about our earnings is in terms of "look-through" results, calculated as follows: Take \$250 million, which is roughly our share of the operating earnings retained by our investees (<20% ownership holdings); subtract... incremental taxes we would have owed had that \$250 million been paid to us in dividends; then add the remainder, \$220 million, to our reported earnings of \$371 million. Thus, our "look-through" earnings were about \$590 million.

Source: Warren Buffett, *The Essays of Warren Buffett: Lessons for Corporate America*, edited by Lawrence A. Cunningham, pp. 180–183 (excerpted).

- 1. What are look-through earnings?
- 2. Why does Warren Buffett favor look-through earnings?

#### **CP 13-5** Reporting investments

#### **Group Project**

In groups of three or four, find the latest annual report for Microsoft Corporation. The annual report can be found on the company's Web site at www.microsoft.com/msft/default.mspx.

The notes to the financial statements include details of Microsoft's investments. Find the notes that provide details of its investments (Note 4) and the income from its investments (Note 3).

From these disclosures, answer the following questions:

- 1. What is the total cost of investments?
- 2. What is the fair value (recorded value) of investments?
- 3. What is the total unrealized gain from investments?
- 4. What is the total unrealized loss from investments?
- 5. What percent of total investments (at fair value) are:
  - a. Cash and equivalents
  - b. Short-term investments
  - c. Equity and other investments (long term)
- 6. What was the total combined dividend and interest revenue?
- 7. What was the recognized net gain or loss from sale of investments?

Internet Project



# Mornin' Joe

Financial Statements for Mornin' Joe

Financial Statements for Mornin' Joe International

# Financial Statements for Mornin' Joe



The financial statements of **Mornin' Joe** follow. Mornin' Joe is a fictitious coffeehouse chain featuring drip and espresso coffee in a café setting. The financial statements of Mornin' Joe are provided to illustrate the complete financial statements of a corporation, using the terms, formats, and reporting illustrated throughout this text. In addition, excerpts of the Mornin' Joe financial statements are used to illustrate the financial reporting presentation for the topics discussed in Chapters 6–13. Thus, you can refer to the complete financial statements in Exhibits 1, 2, 3, and 4 here or the excerpts in Chapters 6–13.

#### **EXHIBIT 1**

Income Statement for Mornin' Joe

Mornin' Joe Income Staten For the Year Ended Dece	nent	6	
Revenue from sales:		¢5 450 000	
Less: Sales returns and allowances.	\$ 26,500	\$5,450,000	
Sales discounts	21,400	47,900	
Sales		17,500	\$5,402,100
Cost of merchandise sold			2,160,000
Gross profit			\$3,242,100
Operating expenses			
Selling expenses:			
Wages expense	\$825,000		
Advertising expense	678,900		
Depreciation expense—buildings	124,300		
Miscellaneous selling expense	26,500		
Total selling expense		\$ 1,654,700	
Administrative expenses:			
Office salaries expense	\$325,000		
Rent expense	425,600		
Payroll tax expense.	110,000		
Depreciation expense—office equipment	68,900		
Bad debt expense	14,000		
Amortization expense	10,500	054.000	
Total administrative expenses		954,000	2 600 700
Total operating expenses			2,608,700 \$ 633,400
Income from operations			\$ 033,400
Interest revenue		\$ 18,000	
Interest expense		(136,000)	
Loss on disposal of fixed asset		(23,000)	
Unrealized gain on trading investments		5,000	
Equity income in AM Coffee		57,000	(79,000)
Income before income taxes			\$ 554,400
Income tax expense			132,800
Net income.			\$ 421,600
Basic earnings per share [(\$421,600 – \$30,000 ) ÷ 44,000			
shares issued and outstanding]			\$ 8.90

Current assets:   Cash and cash equivalents
Cash and cash equivalents.       \$ 235,000         Trading investments (at cost)       \$ 420,000         Plus valuation allowance for trading investments       45,000         Accounts receivable       \$ 305,000         Less allowance for doubtful accounts       12,300         Merchandise inventory—at lower of cost (first-in, first-out method) or market       120,000         Prepaid insurance       24,000         Total current assets       \$ 120,000         Investments:       \$ 565,000         Investment in AM Coffee (equity method)       \$ 565,000         Property, plant, and equipment:       \$ 1,850,000         Land       \$ 1,850,000         Less accumulated depreciation       420,000       2,230,000         Office equipment       \$ 350,000       \$ 43,28,000         Less accumulated depreciation       102,000       248,000         Intangible assets:       \$ 140,000       \$ 4,328,000         Patents       \$ 140,000       \$ 6,169,700         Liabilities         Accounts payable       \$ 133,000       \$ 6,169,700         Notes payable (current portion)       200,000       \$ 6,169,700         Payroll taxes payable       42,000       40,000       \$ 431,400         Interest payable </th
Trading investments (at cost)         \$ 420,000           Plus valuation allowance for trading investments         45,000         465,000           Accounts receivable         \$ 305,000           Less allowance for doubtful accounts         12,300         292,700           Merchandise inventory—at lower of cost         (first-in, first-out method) or market         120,000           Prepaid insurance         24,000         51,136,700           Investments:         Investment in AM Coffee (equity method)         565,000           Property, plant, and equipment:         \$1,850,000           Land         \$1,850,000           Buildings         \$2,650,000           Less accumulated depreciation         420,000         2,230,000           Office equipment         \$ 350,000         4,328,000           Less accumulated depreciation         102,000         248,000           Total property, plant, and equipment         4,328,000           Intangible assets:         140,000           Patents         140,000           Total assets         \$ 140,000           Total assets         \$ 200,000           Salaries and wages payable         \$ 133,000           Notes payable (current portion)         200,000           Salaries and wages payable
Plus valuation allowance for trading investments         45,000         465,000           Accounts receivable         \$ 305,000         292,700           Less allowance for doubtful accounts         12,300         292,700           Merchandise inventory—at lower of cost         120,000         12,000           (first-in, first-out method) or market         120,000         24,000           Prepaid insurance         24,000         51,136,700           Investments:         Investment in AM Coffee (equity method)         565,000           Property, plant, and equipment:         \$1,850,000         565,000           Property, plant, and equipment:         \$1,850,000         2,230,000           Less accumulated depreciation         420,000         2,230,000           Office equipment         \$ 350,000         248,000           Less accumulated depreciation         102,000         248,000           Total property, plant, and equipment         4,328,000           Intangible assets:         140,000           Patents         140,000           Total assets         \$ 133,000           Notes payable         \$ 133,000           Notes payable (current portion)         200,000           Salaries and wages payable         42,000           Payroll t
Accounts receivable         \$ 305,000           Less allowance for doubtful accounts         12,300         292,700           Merchandise inventory—at lower of cost         120,000         120,000           (first-in, first-out method) or market         120,000         24,000           Prepaid insurance         24,000         51,136,700           Investments:         565,000         565,000           Investment in AM Coffee (equity method)         51,850,000         565,000           Property, plant, and equipment:         420,000         2,230,000           Less accumulated depreciation         420,000         2,230,000           Office equipment         \$ 350,000         4,328,000           Less accumulated depreciation         102,000         248,000           Intangible assets:         140,000         4,328,000           Intangible assets:         140,000         56,169,700           Liabilities           Current liabilities:         \$ 133,000         56,169,700           Liabilities:           Accounts payable (current portion)         200,000         56,169,700           Salaries and wages payable         42,000         42,000           Payroll taxes payable         42,000         40,000 <t< td=""></t<>
Less allowance for doubtful accounts         12,300         292,700           Merchandise inventory—at lower of cost (first-in, first-out method) or market         120,000           Prepaid insurance         24,000           Total current assets         \$1,136,700           Investments: Investment in AM Coffee (equity method)         565,000           Property, plant, and equipment:         \$1,850,000           Land         \$1,850,000           Buildings         \$2,650,000           Less accumulated depreciation         420,000         2,230,000           Office equipment         \$350,000         4,328,000           Less accumulated depreciation         102,000         248,000           Total property, plant, and equipment         4,328,000           Intangible assets:         140,000           Patents         140,000           Total assets         \$133,000           Notes payable         \$133,000           Notes payable (current portion)         200,000           Salaries and wages payable         42,000           Payroll taxes payable         16,400           Interest payable         40,000           Total current liabilities:         \$431,400           Long-term liabilities:         \$500,000
Merchandise inventory—at lower of cost         120,000           (first-in, first-out method) or market         120,000           Prepaid insurance         24,000           Total current assets         \$1,136,700           Investments:         565,000           Investment in AM Coffee (equity method)         565,000           Property, plant, and equipment:         \$1,850,000           Land         \$1,850,000           Buildings         \$2,650,000           Less accumulated depreciation         420,000           Office equipment         \$350,000           Less accumulated depreciation         102,000           Total property, plant, and equipment         4,328,000           Intangible assets:         140,000           Patents         140,000           Total assets         \$140,000           Se6,169,700           Liabilities           Accounts payable         \$133,000           Notes payable (current portion)         200,000           Salaries and wages payable         42,000           Payroll taxes payable         16,400           Interest payable         40,000           Total current liabilities         \$431,400           Long-term liabilities:         \$50,000
(first-in, first-out method) or market         120,000           Prepaid insurance         24,000           Total current assets         \$1,136,700           Investments:           1,136,700           Investment in AM Coffee (equity method)         565,000           Property, plant, and equipment:           1,850,000           Land         \$1,850,000           Buildings         \$2,650,000           Less accumulated depreciation         420,000         2,230,000           Office equipment         \$350,000         248,000           Less accumulated depreciation         102,000         248,000           Total property, plant, and equipment         4,328,000           Intangible assets:         140,000           Patents         140,000           Total assets         \$6,169,700           Current liabilities:           Accounts payable         \$133,000           Notes payable (current portion)         200,000           Salaries and wages payable         42,000           Payroll taxes payable         16,400           Interest payable         40,000           Total current liabilities         \$431,400           Long-term liabilities:         \$500,000           Less unamortized
Prepaid insurance         24,000           Total current assets         \$1,136,700           Investments:         565,000           Investment in AM Coffee (equity method)         565,000           Property, plant, and equipment:         \$1,850,000           Land         \$1,850,000           Buildings         \$2,650,000           Less accumulated depreciation         420,000         2,230,000           Office equipment         \$350,000         248,000           Less accumulated depreciation         102,000         248,000           Total property, plant, and equipment         4,328,000           Intangible assets:         \$140,000           Patents         140,000           Total assets         \$56,169,700           Current liabilities:           Accounts payable         \$133,000           Notes payable (current portion)         200,000           Salaries and wages payable         42,000           Payroll taxes payable         40,000           Interest payable         40,000           Total current liabilities         \$431,400           Long-term liabilities:         \$500,000           Bonds payable, 8%, due December 31, 2032         \$500,000           Less unamortized
Investment in AM Coffee (equity method)   565,000
Investment in AM Coffee (equity method)   565,000
Land         \$1,850,000           Buildings         \$2,650,000           Less accumulated depreciation         420,000         2,230,000           Office equipment         \$ 350,000         248,000           Less accumulated depreciation         102,000         248,000           Total property, plant, and equipment         4,328,000           Intangible assets:         140,000           Patents         140,000           Total assets         \$ 133,000           Notes payable         \$ 133,000           Notes payable (current portion)         200,000           Salaries and wages payable         42,000           Payroll taxes payable         16,400           Interest payable         40,000           Total current liabilities         \$ 431,400           Long-term liabilities:         \$ 500,000           Bonds payable, 8%, due December 31, 2032         \$ 500,000           Less unamortized discount         16,000         \$ 484,000
Land       \$1,850,000         Buildings       \$2,650,000         Less accumulated depreciation       420,000       2,230,000         Office equipment       \$350,000       248,000         Less accumulated depreciation       102,000       248,000         Total property, plant, and equipment       4,328,000         Intangible assets:       140,000         Patents       140,000         Total assets       \$6,169,700         Liabilities         Current liabilities:       \$133,000         Notes payable (current portion)       200,000         Salaries and wages payable       42,000         Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities       \$ 431,400         Long-term liabilities:       \$ 500,000         Bonds payable, 8%, due December 31, 2032       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Buildings       \$2,650,000         Less accumulated depreciation       420,000       2,230,000         Office equipment       \$ 350,000       248,000         Less accumulated depreciation       102,000       248,000         Total property, plant, and equipment       4,328,000         Intangible assets:       140,000         Patents       \$ 140,000         Total assets       \$ 6,169,700     Current liabilities:  Accounts payable  Accounts payable (current portion)  Salaries and wages payable  42,000  Payroll taxes payable  16,400  Interest payable  Total current liabilities  \$ 431,400         Long-term liabilities:  Bonds payable, 8%, due December 31, 2032  Less unamortized discount       \$ 500,000  \$ 484,000
Less accumulated depreciation       420,000       2,230,000         Office equipment       \$ 350,000       248,000         Less accumulated depreciation       102,000       248,000         Total property, plant, and equipment       4,328,000         Intangible assets:       140,000         Patents       140,000         Total assets       \$ 6,169,700         Liabilities         Current liabilities:       \$ 133,000         Notes payable (current portion)       200,000         Salaries and wages payable       42,000         Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities       \$ 431,400         Long-term liabilities:       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Office equipment         \$ 350,000           Less accumulated depreciation         102,000           Total property, plant, and equipment         4,328,000           Intangible assets:         140,000           Patents         140,000           Total assets         \$6,169,700           Liabilities           Current liabilities:         \$ 133,000           Notes payable (current portion)         200,000           Salaries and wages payable         42,000           Payroll taxes payable         16,400           Interest payable         40,000           Total current liabilities         \$ 431,400           Long-term liabilities:         \$ 500,000           Less unamortized discount         16,000         \$ 484,000
Less accumulated depreciation102,000248,000Total property, plant, and equipment4,328,000Intangible assets:140,000Patents140,000Total assets\$6,169,700LiabilitiesCurrent liabilities:Accounts payable\$ 133,000Notes payable (current portion)200,000Salaries and wages payable42,000Payroll taxes payable16,400Interest payable40,000Total current liabilities:\$ 431,400Long-term liabilities:\$ 500,000Less unamortized discount16,000
Total property, plant, and equipment
Intangible assets:   Patents
Patents         140,000           Total assets         \$6,169,700           Liabilities           Current liabilities:           Accounts payable         \$ 133,000           Notes payable (current portion)         200,000           Salaries and wages payable         42,000           Payroll taxes payable         16,400           Interest payable         40,000           Total current liabilities         \$ 431,400           Long-term liabilities:         \$ 500,000           Less unamortized discount         16,000         \$ 484,000
Liabilities         Current liabilities:       \$ 133,000         Accounts payable (current portion)       200,000         Salaries and wages payable       42,000         Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities       \$ 431,400         Long-term liabilities:       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Current liabilities:       \$ 133,000         Accounts payable (current portion)       200,000         Salaries and wages payable       42,000         Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities:       \$ 431,400         Long-term liabilities:       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Current liabilities:       \$ 133,000         Accounts payable (current portion)       200,000         Salaries and wages payable       42,000         Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities:       \$ 431,400         Long-term liabilities:       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Accounts payable       \$ 133,000         Notes payable (current portion)       200,000         Salaries and wages payable       42,000         Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities       \$ 431,400         Long-term liabilities:       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Notes payable (current portion)       200,000         Salaries and wages payable       42,000         Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities       \$ 431,400         Long-term liabilities:       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Salaries and wages payable       42,000         Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities       \$ 431,400         Long-term liabilities:       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Payroll taxes payable       16,400         Interest payable       40,000         Total current liabilities       \$ 431,400         Long-term liabilities:       \$ 500,000         Less unamortized discount       16,000       \$ 484,000
Interest payable         40,000           Total current liabilities         \$ 431,400           Long-term liabilities:         \$ 500,000           Less unamortized discount         16,000         \$ 484,000
Total current liabilities
Bonds payable, 8%, due December 31, 2032
Less unamortized discount
Notes payable
Total long-term liabilities
Total liabilities
Stockholdors' Equity
Stockholders' Equity Paid-in capital:
Preferred 10% stock, \$50 par (6,000 shares
authorized and issued)\$ 300,000
Excess of issue price over par
Common stock, \$20 par (50,000 shares
authorized, 45,000 shares issued)
Excess of issue price over par <u>1,450,000</u> <u>2,350,000</u>
Total paid-in capital
Retained earnings
Total
Deduct treasury stock (1,000 shares at cost)
Total stockholders' equity
30,109,700

## EXHIBIT 2

Balance Sheet for Mornin' Joe

## **EXHIBIT 3**

Retained Earnings Statement for Mornin' Joe

Mornin' Joe Retained Earnings S For the Year Ended Decer	tatement	5	
Retained earnings, January 1, 2016  Net income Less dividends:		\$421,600	\$ 852,700
Preferred stock	\$30,000	74.000	
Common stock Increase in retained earnings	44,000	<u>74,000</u>	347,600 \$1,200,300

# EXHIBIT 4

#### Statement of Stockholders' Equity for Mornin' Joe

Mornin' Joe Statement of Stockholders' Equity For the Year Ended December 31, 2016							
	Preferred Stock	Common Stock	Additional Paid-In Capital	Retained Earnings	Treasury Stock	Total	
Balance, January 1, 2016	\$300,000	\$800,000	\$1,325,000	\$852,700	\$(36,000)	\$3,241,700	
Net income				421,600		421,600	
Dividends on preferred stock				(30,000)		(30,000)	
Dividends on common stock				(44,000)		(44,000)	
Issuance of additional common stock		100,000	175,000			275,000	
Purchase of treasury stock					(10,000)	(10,000)	
Balance, December 31, 2016	\$300,000	\$900,000	\$1,500,000	\$1,200,300	\$(46,000)	\$3,854,300	

# Financial Statements for Mornin' Joe International

**Mornin' Joe** is planning to expand operations to various places around the world. Financing for this expansion will come from foreign banks. While financial statements prepared under U.S. GAAP may be appropriate for U.S. operations, financial statements prepared for foreign bankers should be prepared using international accounting standards.



The European Union (EU) has developed accounting standards similar in structure to U.S. standards. Its accounting standards board is called the International Accounting Standards Board (IASB). The IASB issues accounting standards that are termed *International Financial Reporting Standards (IFRS)*. The intent of the IASB is to create a set of financial standards that can be used by public companies worldwide, not just in the EU.

Currently, the EU countries and more than 100 other countries around the world have adopted or are planning to adopt IFRS. As a result, there are efforts under way to converge U.S. GAAP with IFRS so as to harmonize accounting standards around the world.

# **Key Reporting Differences between IFRS and U.S. GAAP**

The financial statements of **Mornin' Joe International** using IFRS are presented in Exhibits 1, 2, and 3. This illustration highlights reporting and terminology differences between IFRS and U.S. GAAP. Differences in recording transactions under IFRS and U.S. GAAP are discussed in Appendix C and in various International Connection boxes throughout the text.

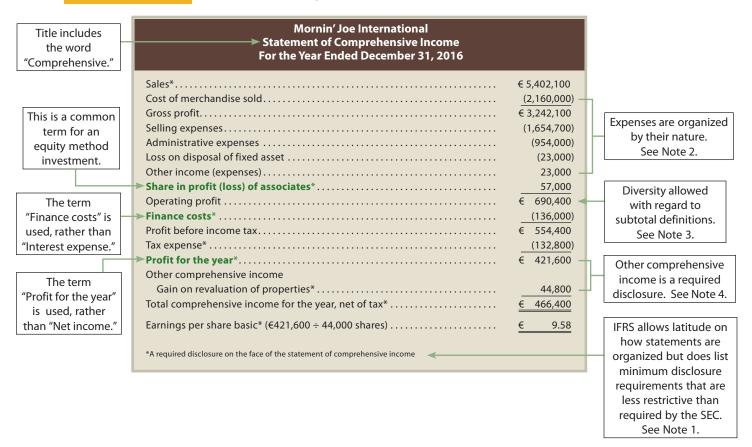
The Mornin' Joe International financial statements in Exhibits 5, 6, and 7 are simplified and illustrate only portions of IFRS that are appropriate for introductory accounting. The financial statements are presented in euros (€) for demonstration purposes only. The euro is the standard currency of the European Union. The euro is translated at a 1:1 ratio from the dollar to simplify comparisons. Throughout the illustration, call-outs and end notes to each statement are used to highlight the differences between financial statements prepared under IFRS and under U.S. GAAP.

#### **Statements of Comprehensive Income versus Income Statements**

Exhibit 5 illustrates the statement of comprehensive income for Mornin' Joe International and shows key differences from the income statements prepared under U.S. GAAP.

### EXHIBIT 5

#### Statement of Comprehensive Income for Mornin' Joe International



- 1. IFRS statements are often more summarized than U.S. GAAP statements. To compensate, IFRS requires specific disclosures on the face of the financial statements (denoted *) and additional disclosures in the footnotes to the financial statements. Because additions and subtractions are grouped together in sections of IFRS statements, parentheses are used to indicate subtractions.
- 2. Expenses in an IFRS income statement are classified by either their nature or function. The nature of an expense is how the expense would naturally be recorded in a journal entry reflecting the economic benefit received for that expense. Examples include salaries, depreciation, advertising, and utilities. The function of an expense identifies the purpose of the expense, such as a selling expense or an administrative expense.

IFRS does not permit the natural and functional classifications to be mixed together on the same statement. That is, all expenses must be classified by either nature or function. However, if a functional classification of expenses is used, a footnote to the income statement must show the natural classification of expenses. To illustrate, because **Mornin' Joe International** uses the functional classification of expenses in its income statement, it must also show the following natural classification of expenses in a footnote:

Cost of product	€2,100,000	The cost of product purchased for resale
Employee benefits expense	1,260,000	Required natural disclosure
Depreciation and amortization expense	203,700	Required natural disclosure
Rent expense	425,600	
Advertising expense	678,900	
Other expenses	58,500	
Total natural expenses	€4,726,700	

- 3. IFRS provides flexibility with regard to line items, headings, and subtotals on the income statement. There is less flexibility under U.S. GAAP for public companies.
- 4. IFRS requires the reporting of other comprehensive income (see appendix to Chapter 13) either on the income statement (see Exhibit 5) or in a separate statement. U.S. GAAP has a similar disclosure treatment. For **Mornin' Joe International**, other comprehensive income consists of the restatement of café locations to fair value (see Note 6 for more details).
- 5. Under IFRS, there is no standard format for the balance sheet (statement of financial position, see Exhibit 6). A typical format for European Union companies is to begin the asset section of the balance sheet with noncurrent assets. This is followed by current assets listed in reverse order of liquidity. That is, the asset side of the balance sheet is reported in reverse order of liquidity from least liquid to most liquid. Listing noncurrent assets first emphasizes the going concern nature of the entity.

The liability and owners' equity side of the balance sheet is also reported differently than under U.S. GAAP. Specifically, owners' equity is reported first followed by noncurrent liabilities and current liabilities. Listing equity first emphasizes the going concern nature of the entity and the long-term financial interest of the owners in the business

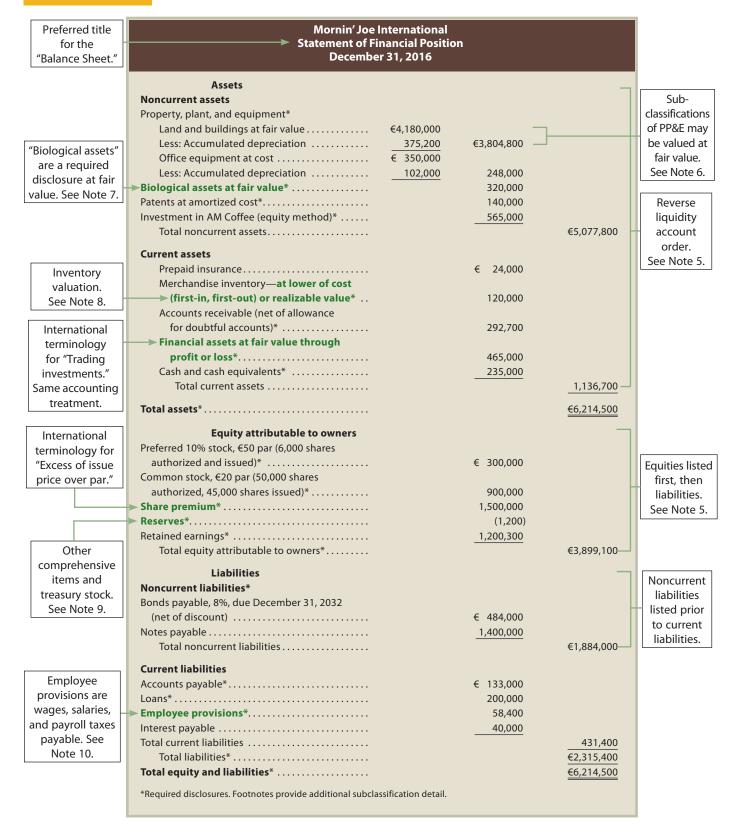
- 6. Under IFRS, property, plant, and equipment (PP&E) may be measured at historical cost or fair value. If fair value is used, the revaluation must be for similar classifications of PP&E but need not be for all PP&E. This departs from U.S. GAAP, which requires PP&E to be measured at historical cost. Mornin' Joe International restated its Land and Buildings to fair value because the café sites have readily available real estate market prices. Land and buildings are included together because their fair values are not separable. The office equipment remains at historical cost because it does not have a readily available market price. The increase in fair value is recorded by reducing accumulated depreciation and recognizing the gain as other comprehensive income. This element of other comprehensive income is accumulated in stockholders' equity under the heading Property revaluation reserve.* This treatment is similar (with different titles) to the U.S. GAAP treatment of unrealized gains (losses) from available-for-sale securities. For Mornin' Joe International, there is an increase in the property revaluation reserve of €44,800. This amount is the only difference between Mornin' Joe's U.S. GAAP net income, total assets, and total stockholders' equity and Mornin' Joe International's IFRS total comprehensive income, total assets, and total stockholders' equity.
- 7. **Mornin' Joe International** recently acquired a coffee plantation. This is an example of a biological asset. IFRS requires separate reporting of biological assets (principally agricultural assets) at fair value.
- 8. Inventories are valued at lower of cost or market; however, "market" is defined as net realizable value under IFRS. U.S. GAAP defines "market" as replacement cost under most conditions. In addition, IFRS prohibits LIFO cost valuation.
- 9. Under IFRS, some elements of other comprehensive income and owner's equity are often aggregated under the term "reserves." In contrast, under U.S. GAAP, "reserve" is used to identify a liability. IFRS also does not require separate disclosure of treasury stock as does U.S. GAAP. Specifically, treasury stock may be reported as a reduction of a reserve, a reduction of a stock premium, or as a separate item.
- 10. The term *provision* is used to denote a liability under IFRS, whereas this term often indicates an expense under U.S. GAAP. For example, *Provision for income taxes* means *Income tax expense* under U.S. GAAP, whereas it would mean *Income taxes payable* under IFRS.
- 11. Under U.S. GAAP, other comprehensive income items must be included as changes in accumulated other comprehensive income in the statement of changes in stockholders' equity (see Exhibit 7). IFRS allows for similar treatment, with wider latitude for terminology, such as *Property Revaluation Reserve* illustrated by the column title here. In this illustration, treasury stock is included as part of a reserve (Reserve for Own Shares). As discussed in Note 9, under U.S. GAAP the term *reserve* denotes a liability.

#### **Statements of Financial Position versus Balance Sheets**

Exhibit 6 illustrates the statement of financial position for **Mornin' Joe International** and shows key differences from the balance sheets prepared under U.S. GAAP.

#### **EXHIBIT 6**

#### Statement of Financial Position for Mornin' Joe International



# Statements of Changes in Equity versus Statements of Stockholders' Equity

Exhibit 7 illustrates the statement of changes in equity for **Mornin' Joe International** and shows key differences from the statements of stockholders' equity prepared under U.S. GAAP.

#### **EXHIBIT 7**

#### Statement of Changes in Equity for Mornin' Joe International

				Reser	ves –	1	
	Preferred Stock	Common Stock	Share Premium	Property Revaluation Reserve	Reserve for Own Shares —	Retained Earnings	Total Equity Attributable to Owners
Profit for the year		€800,000	€1,325,000	€ 0	(€36,000)	€ 852,700 421,600	€3,241,700 421,600
Other comprehensive income Property revaluation (gain)				44,800			44,800
Total comprehensive income				€44,800		€ 421,600	€ 466,400
Contributions by and distributions to owners Dividends on preferred stock						(30,000)	(30,000)
Dividends on common stock ssuance of additional						(44,000)	(44,000)
common stock		100,000	175,000				275,000
Purchase of own shares					(10,000)		(10,000)

# Discussion Questions

- 1. Contrast U.S. GAAP financial statement terms with their differing IFRS terms.
- 2. What is the difference between classifying an expense by nature or function?
- 3. If a functional expense classification is used for the statement of comprehensive income, what must also be disclosed?
- 4. How is the term "provision" used differently under IFRS than under U.S. GAAP?
- 5. What are two main differences in inventory valuation under IFRS compared to U.S. GAAP?

- 6. What is a "biological asset"?
- 7. What is the most significant IFRS departure from U.S. GAAP for valuing property, plant, and equipment?
- 8. What is a "share premium"?
- 9. How is the term "reserve" used under IFRS, and how does it differ from its meaning under U.S. GAAP?
- 10. How is treasury stock reported under IFRS? How does this differ from its treatment under U.S. GAAP?

# IFRS Activity 1

**Unilever Group** is a global company that markets a wide variety of products, including Lever[®] soap, Breyer's[®] ice cream, and Hellman's[®] mayonnaise. A recent income statement and statement of comprehensive income for the Dutch company, Unilever Group, follow:

Unilever Group Consolidated Income Statement For the Year Ended December 31 (in millions of euros)	
Turnover	€51,324
Operating profit	6,989
After (charging)/crediting:	
Non-core items	(73)
Net finance costs	(397)
Finance income	136
Finance costs.	(526)
Pensions and similar obligations	(7)
Share of net profit/(loss) of joint ventures and associations	105
Other income from non-current investments	(14)
Profit before taxation	€ 6,683
Taxation	(1,735)
Net profit	€ 4,948
Earnings per share—basic.	€ 1.58
Earnings per share—diluted	€ 1.54

Consolidated Statement of Comprehensive Income For the Year Ended December 31	
Fair value gains (losses), net of tax  Actuarial gains (losses) on pensions, net of tax  Currency retranslation gains (losses), net of tax  Net income (expense) recognized directly into equity	€ (125) (644) (316) €(1,085)
Net profit	<u>4,948</u> <u>€3,863</u>

- a. What do you think is meant by "turnover"?
- b. How does Unilever's income statement presentation differ significantly from that of Mornin' Joe?
- c. How is the total for net finance costs presented differently than would be typically found under U.S. GAAP?



The following is a recent consolidated statement of financial position on December 31 of a recent year for LVMH, a French company that markets the Louis Vuitton® and Moët Hennessy® brands:

LVMH Statement of Financial Position December 31 (in millions of euros)	
Assets	
Brands and other intangible assets—net	€11,510
Goodwill—net	7,806
Property, plant, and equipment—net	8,769
Investment in associates	163
Non-current available for sale financial assets	6,004
Other non-current assets	524
Deferred tax	881
Non-current assets	€35,657
Inventories	€ 8,080
Trade accounts receivable.	1,985
Income taxes.	201
Other current assets	1,811
Cash and cash equivalents	2,196
Current assets	€14,273
TOTAL ASSETS	<del>€</del> 49,930
Liabilities and Equity  Share capital	€ 152
Share premium.	3,848
Treasury shares	(414)
Revaluation reserves	2,819
Other reserves	14,393
Cumulative translation adjustment	342
Net profit, group share	3,424
Equity, group share	€24,564
Minority interests	1,102
Total equity	€25,666
Long-term borrowings	€ 3,836
Provisions	1,530
Deferred tax	3,960
Other non-current liabilities.	5,456
Total non-current liabilities	€14,782
Short-term borrowings	€ 2,976
Trade accounts payable	3,134
Income taxes payable	442
Provisions	335
Other current liabilities	2,595
Total current liabilities	€ 9,482
TOTAL LIABILITIES AND EQUITY	€49,930

a. Identify presentation differences between the balance sheet of LVMH and a balance sheet prepared under U.S. GAAP. Use the Mornin' Joe balance sheet (Exhibit 2) as an example of a U.S. GAAP balance sheet. (Ignore minority interests and cumulative translation adjustment.)

(Continued)

b. Compare the terms used in this balance sheet with the terms used by Mornin' Joe (Exhibit 2), using the table that follows:

# LVMH Term Mornin' Joe U.S. GAAP Term

Statement of financial position

Share capital

Share premium

Other reserves

Provisions

c. What does the "Revaluation reserves" in the Equity section of the balance sheet represent?

# IFRS Activity 3

Under U.S. GAAP, LIFO is an acceptable inventory method. Financial statement information for three companies that use LIFO follows. All table numbers are in millions of dollars.

			Impact on Net Income from		
		FIFO	Using LIFO Rather	Total	
		Inventory	than FIFO (from	Current	Net Income as
	LIFO Inventory	(from notes)	notes)	Assets	Reported
Exxon	\$9,852	\$31,200	\$317	\$58,984	\$30,460
Kroger	4,966	5,793	(57)	7,621	1,116
Ford Motor*	5,917	6,782	4	34,368	4,690

^{*}Autos and trucks only

Assume these companies adopted IFRS, and thus were required to use FIFO, rather than LIFO.

a. Prepare a table with the following columns:

(1)	(2)	(3)	(4)
FIFO less LIFO	IFRS Net Income	(FIFO less LIFO)	IFRS Net Income (Col. 2)
		Total Current Assets	Reported Net Income

- (1) Difference between FIFO and LIFO inventory valuation.
- (2) Revised IFRS net income using FIFO.
- (3) Difference between FIFO and LIFO inventory valuation as a percent of total current assets.
- (4) Revised IFRS net income as a percent of the reported net income.
- b. Complete the table for the three companies.
- c. For which company would a change to IFRS for inventory valuation have the largest percentage impact on total current assets (Col. 3)?
- d. For which company would a change to IFRS for inventory valuation have the largest percentage impact on net income (Col. 4)?
- e. Why might Kroger have a negative impact on net income from using LIFO, while the other two companies have a positive impact on net income from using LIFO?



# Statement of Cash Flows

# National Beverage Co.

Suppose you were to receive \$100 from an event. Would it make a difference what the event was? Yes, it would! If you received \$100 for your birthday, then it's a gift. If you received \$100 as a result of working part time for a week, then it's the result of your effort. If you received \$100 as a loan, then it's money that you will have to pay back in the future. If you received \$100 as a result of selling your iPod, then it's the result of selling an asset. Thus, \$100 received can be associated with different types of events, and these events have different meanings to you, and different implications for your future. You would much rather receive a \$100 gift than take out a \$100 loan. Likewise, company stakeholders view inflows and outflows of cash differently, depending on their source.

Companies are required to report information about the events causing a change in cash over a period of time. This information is reported in the statement of cash flows. One such company is **National Beverage**, which is an alternative

beverage company, known for its innovative soft drinks, enhanced juices and waters, and fortified powders and supplements. You have probably seen the company's **Shasta** and **Faygo** soft drinks, or **LaCroix**, **Everfresh**, and **Crystal Bay** drinks at your local grocery or convenience store. As with any company, cash is important to National Beverage. Without cash, National Beverage would be unable to expand its brands, distribute its product, support extreme sports, or provide a return for its owners. Thus, its managers are concerned about the sources and uses of cash.

In previous chapters, we have used the income statement, balance sheet, statement of retained earnings, and other information to analyze the effects of management decisions on a business's financial position and operating performance. In this chapter, we focus on the events causing a change in cash by presenting the preparation and use of the statement of cash flows.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe the cash flow activities reported in the statement of cash flows.  Reporting Cash Flows  Cash Flows from Operating Activities  Cash Flows from Investing Activities  Cash Flows from Financing Activities  Noncash Investing and Financing Activities  No Cash Flow per Share  Format of the Statement of Cash Flows	EE 14-1
Prepare a statement of cash flows, using the indirect method. Preparing the Statement of Cash Flows—The Indirect Method Retained Earnings Adjustments to Net Income Dividends Common Stock Bonds Payable Building Land Preparing the Statement of Cash Flows	EE 14-2, 3, 4 EE 14-5
Prepare a statement of cash flows, using the direct method. Preparing the Statement of Cash Flows—The Direct Method Cash Received from Customers Cash Payments for Merchandise Cash Payments for Operating Expenses Gain on Sale of Land Interest Expense Cash Payments for Income Taxes Reporting Cash Flows from Operating Activities—Direct Method	EE 14-6 EE 14-7
Describe and illustrate the use of free cash flow in evaluating a company's cash flow. Financial Analysis and Interpretation: Free Cash Flow  At a	<b>EE 14-8 Glance 14</b> Page 666



# **Reporting Cash Flows**

The statement of cash flows reports a company's cash inflows and outflows for a period. The statement of cash flows provides useful information about a company's ability to do the following:

- Generate cash from operations
- Maintain and expand its operating capacity
- Meet its financial obligations
- Pay dividends

The statement of cash flows is used by managers in evaluating past operations and in planning future investing and financing activities. It is also used by external users such as investors and creditors to assess a company's profit potential and ability to pay its debt and pay dividends.

The statement of cash flows reports three types of cash flow activities, as follows:

1. Cash flows from operating activities are the cash flows from transactions that affect the net income of the company.

Example: Purchase and sale of merchandise by a retailer.

2. Cash flows from investing activities are the cash flows from transactions that affect investments in the noncurrent assets of the company.

Example: Purchase and sale of fixed assets, such as equipment and buildings.

¹ As used in this chapter, cash refers to cash and cash equivalents. Examples of cash equivalents include short-term, highly liquid investments, such as money market accounts, bank certificates of deposit, and U.S. Treasury bills.

#### Note:

The statement of cash flows reports cash flows from operating, investing, and financing activities.

3. **Cash flows from financing activities** are the cash flows from transactions that affect the debt and equity of the company.

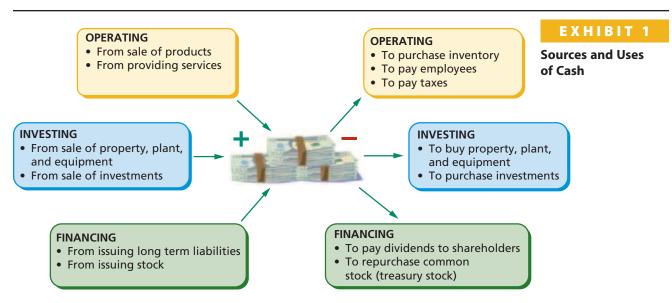
Example: Issuing or retiring equity and debt securities.

The cash flows are reported in the statement of cash flows as follows:

Cash flows from operating activities	\$XXX
Cash flows from investing activities	XXX
Cash flows from financing activities	$_{XXX}$
Net increase or decrease in cash for the period	\$XXX
Cash at the beginning of the period	$_{XXX}$
Cash at the end of the period	\$XXX

The ending cash on the statement of cash flows equals the cash reported on the company's balance sheet at the end of the year.

Exhibit 1 illustrates the sources (increases) and uses (decreases) of cash by each of the three cash flow activities. A *source* of cash causes the cash flow to increase and is called a *cash inflow*. A *use* of cash causes cash flow to decrease and is called *cash outflow*.



# **Cash Flows from Operating Activities**

Cash flows from operating activities reports the cash inflows and outflows from a company's day-to-day operations. Companies may select one of two alternative methods for reporting cash flows from operating activities in the statement of cash flows:



In fiscal 2012, Google Inc. generated \$16.6

billion in net cash flow from operating activities.

- The direct method
- · The indirect method

Both methods result in the same amount of cash flows from operating activities. They differ in the way they report cash flows from operating activities.

**The Direct Method** The direct method reports operating cash inflows (receipts) and cash outflows (payments) as follows:

Cash flows from operating activities:		
Cash received from customers		\$XXX
Less: Cash payments for merchandise	\$XXX	
Cash payments for operating expenses	XXX	
Cash payments for interest	XXX	
Cash payments for income taxes	XXX	XXX
Net cash flow from operating activities		\$XXX

The primary operating cash inflow is cash received from customers. The primary operating cash outflows are cash payments for merchandise, operating expenses, interest, and income tax payments. The cash received from operating activities less the cash payments for operating activities is the net cash flow from operating activities.

The primary advantage of the direct method is that it directly reports cash receipts and cash payments in the statement of cash flows. Its primary disadvantage is that these data may not be readily available in the accounting records. Thus, the direct method is normally more costly to prepare and, as a result, is used infrequently in practice.

The Indirect Method The indirect method reports cash flows from operating activities by beginning with net income and adjusting it for revenues and expenses that do not involve the receipt or payment of cash, as follows:

> Cash flows from operating activities: Net income **\$XXX** Adjustments to reconcile net income to net cash flow from operating activities XXX Net cash flow from operating activities **\$XXX**

The adjustments to reconcile net income to net cash flow from operating activities include such items as depreciation and gains or losses on fixed assets. Changes in current operating assets and liabilities such as accounts receivable or accounts payable are also added or deducted, depending on their effect on cash flows. In effect, these additions and deductions adjust net income, which is reported on an accrual accounting basis, to cash flows from operating activities, which is a cash basis.

A primary advantage of the indirect method is that it reconciles the differences between net income and net cash flows from operations. In doing so, it shows how net income is related to the ending cash balance that is reported on the balance sheet.

Because the data are readily available, the indirect method is less costly to prepare than the direct method. As a result, the indirect method of reporting cash flows from operations is most commonly used in practice.

Comparing the Direct and Indirect Methods Exhibit 2 illustrates the Cash Flows from Operating Activities section of the statement of cash flows for NetSolutions. Exhibit 2 shows the direct and indirect methods using the NetSolutions data from Chapter 1. As Exhibit 2 illustrates, both methods report the same amount of net cash flow from operating activities, \$2,900.

#### **EXHIBIT 2**

#### Cash Flow from Operations: Direct and Indirect Methods—NetSolutions

Direct Method	ı
Cash flows from operating activities:	(
Cash received from customers \$7,500	
Deduct cash payments for expenses	
and payments to creditors	
Net cash flow from operating activities	

Indirect Method	
Cash flows from operating activities:	
Net income	\$3,050
Add increase in accounts payable	400
	\$3,450
Deduct increase in supplies	550
Net cash flow from operating activities	<mark>\$2,900</mark>
the same	T



# Business **Connection**

#### CASH CRUNCH!

In late 2011, American Airlines' deteriorating cash flow situation forced the company to file for bankruptcy. At the time, the airline had generated \$235 million in net cash flow from operating activities for the nine-month period ending September 31, 2011, while spending \$1.1 billion on additional property, plant, and equipment. The property, plant, and equipment purchases were paid for by issuing additional debt. By Thanksgiving 2011, it became clear that the company's weak net cash flow from operating activities would not be sufficient to pay off the airline's massive debt. On November 29, 2011, the airline filed for bankruptcy. In February 2013, American and U.S. Airways announced plans to merge, creating the largest airline in the world.

Source: M. Curriden and N. Posgate, "American Airlines bankruptcy, merger deals were complex, expensive," Dallas Morning News, February 17, 2013.

\$XXX

# **Cash Flows from Investing Activities**

Cash flows from investing activities show the cash inflows and outflows related to changes in a company's long-term assets. Cash flows from investing activities are reported on the statement of cash flows as follows:

Cash flows from investing activities:

Cash inflows from investing activities \$XXX Less cash used for investing activities XXX

Net cash flows from investing activities

Cash inflows from investing activities normally arise from selling fixed assets, investments, and intangible assets. Cash outflows normally include payments to purchase fixed assets, investments, and intangible assets.

# **Cash Flows from Financing Activities**

Cash flows from financing activities show the cash inflows and outflows related to changes in a company's long-term liabilities and stockholders' equity. Cash flows from financing activities are reported on the statement of cash flows as follows:

Cash flows from financing activities:

Cash inflows from financing activities \$XXX Less cash used for financing activities XXX

Net cash flow from financing activities \$XXX

Cash inflows from financing activities normally arise from issuing long-term debt or equity securities. For example, issuing bonds, notes payable, preferred stock, and common stock creates cash inflows from financing activities. Cash outflows from financing activities include paying cash dividends, repaying long-term debt, and acquiring treasury stock.

# **Noncash Investing and Financing Activities**

A company may enter into transactions involving investing and financing activities that do not *directly* affect cash. For example, a company may issue common stock to retire long-term debt. Although this transaction does not directly affect cash, it does eliminate future cash payments for interest and for paying the bonds when they mature. Because such transactions *indirectly* affect cash flows, they are reported in a separate section of the statement of cash flows. This section usually appears at the bottom of the statement of cash flows.

### Format of the Statement of Cash Flows

The statement of cash flows presents the cash flows generated by, or used for, the three activities previously discussed: operating, investing, and financing. These three activities are always reported in the same order, following the format illustrated in Exhibit 3.

COMPANY NAME Statement of Cash Flows For the Year Ended xxxx		
Cash flows from operating activities		
(List of individual items, as illustrated in Exhibit 1)	XXX	
Net cash flows from operating activities		\$XXX
Cash flows from investing activities		
(List of individual items, as illustrated in Exhibit 1)	XXX	
Net cash flows from (used for) investing activities		XXX
Cash flows from financing activities		
(List of individual items, as illustrated in Exhibit 1)	XXX	
Net cash flows from (used for) financing activities		XXX
Increase (decrease) in cash		\$XXX
Cash at the beginning of the period		XXX
Cash at the end of the period		\$XXX
Noncash investing and financing activites		\$XX

EXHIBIT 3

In March 2013, U.S. companies

in the S&P 500

index were expected to pay \$300 billion in dividends to

investors during 2013.

Format of the Statement of Cash Flows

## Example Exercise 14-1 Classifying Cash Flows



Identify whether each of the following would be reported as an operating, investing, or financing activity in the statement of cash flows:

- a. Purchase of patent
- b. Payment of cash dividend
- c. Disposal of equipment
- d. Cash sales
- e. Purchase of treasury stock
- f. Payment of wages expense

#### Follow My Example 14-1

- a. Investing
- b. Financing
- c. Investing

- d. Operating
- e. Financing
- f. Operating

Practice Exercises: PE 14-1A, PE 14-1B

# No Cash Flow per Share

**Cash flow per share** is sometimes reported in the financial press. As reported, cash flow per share is normally computed as *cash flow from operations divided by the number of common shares outstanding*. However, such reporting may be misleading because of the following:

- Users may misinterpret cash flow per share as the per-share amount available for dividends. This would not be the case if the cash generated by operations is required for repaying loans or for reinvesting in the business.
- Users may misinterpret cash flow per share as equivalent to (or better than) earnings per share.

For these reasons, the financial statements, including the statement of cash flows, should not report cash flow per share.

# Prepare a statement of cash flows, using the indirect method.

# Preparing the Statement of Cash Flows— The Indirect Method

The indirect method of reporting cash flows from operating activities uses the logic that a change in any balance sheet account (including cash) can be analyzed in terms of changes in the other balance sheet accounts. Thus, by analyzing changes in noncash balance sheet accounts, any change in the cash account can be *indirectly* determined.

To illustrate, the accounting equation can be solved for cash as follows:

```
Assets = Liabilities + Stockholders' Equity \\ Cash + Noncash Assets = Liabilities + Stockholders' Equity \\ Cash = Liabilities + Stockholders' Equity - Noncash Assets
```

Therefore, any change in the cash account can be determined by analyzing changes in the liability, stockholders' equity, and noncash asset accounts as follows:

Change in Cash = Change in Liabilities + Change in Stockholders' Equity - Change in Noncash Assets

Under the indirect method, there is no order in which the balance sheet accounts must be analyzed. However, net income (or net loss) is the first amount reported on the statement of cash flows. Because net income (or net loss) is a component of any change in Retained Earnings, the first account normally analyzed is Retained Earnings.

To illustrate the indirect method, the income statement and comparative balance sheets for **Rundell Inc.**, shown in Exhibit 4, are used. Ledger accounts and other data supporting the income statement and balance sheet are presented as needed.²

#### Rundell Inc. **Income Statement** For the Year Ended December 31, 2016 \$1,180,000 790,000 Cost of merchandise sold ..... \$ 390,000 Operating expenses: \$ 7,000 Depreciation expense ..... 196,000 Other operating expenses ..... Total operating expenses..... 203,000 Income from operations ..... \$ 187,000 Other income: \$ 12,000 Gain on sale of land ..... Other expense: Interest expense ..... 8,000 4,000 Income before income tax ..... \$ 191,000 Income tax expense ..... 83,000 \$ 108,000 Net income .....

#### **EXHIBIT 4**

Income Statement and Comparative Balance Sheet

Rundell Inc. Comparative Balance Sheet December 31, 2016 and 2015								
Increase 2016 2015 Decrease*								
Assets								
Cash	\$ 97,500	\$ 26,000	\$ 71,500					
Accounts receivable (net)	74,000	65,000	9,000					
Inventories	172,000	180,000	8,000*					
Land	80,000	125,000	45,000*					
Building	260,000	200,000	60,000					
Accumulated depreciation—building	_(65,300)	_(58,300)	7,000**					
Total assets	\$618,200	\$537,700	\$ 80,500					
Liabilities								
Accounts payable (merchandise creditors)	\$ 43,500	\$ 46,700	\$ 3,200*					
Accrued expenses payable (operating expenses)	26,500	24,300	2,200					
Income taxes payable	7,900	8,400	500*					
Dividends payable	14,000	10,000	4,000					
Bonds payable	100,000	150,000	<u>50,000</u> *					
Total liabilities	\$191,900	\$239,400	\$ 47,500*					
Stockholders' Equity								
Common stock (\$2 par)	\$ 24,000	\$ 16,000	\$ 8,000					
Paid-in capital in excess of par	120,000	80,000	40,000					
Retained earnings	282,300	202,300	80,000					
Total stockholders' equity	\$426,300	\$298,300	\$128,000					
Total liabilities and stockholders' equity	\$618,200	\$537,700	\$ 80,500					
**There is a \$7,000 increase to Accumulated Depreciation—Building, which is a contra asset account. As a result, the \$7,000 increase in this account must be subtracted in summing to the increase in Total assets of \$80,500.								

²An appendix that discusses using a spreadsheet (work sheet) as an aid in assembling data for the statement of cash flows is presented at the end of this chapter. This appendix illustrates the use of this spreadsheet in reporting cash flows from operating activities using the indirect method.

# **Retained Earnings**

The comparative balance sheet for **Rundell Inc.** shows that retained earnings increased \$80,000 during the year. The retained earnings account that follows indicates how this change occurred:

Account Retained Earnings Account No.						
				Credit	Balance	
Da	te	Item	Debit		Debit	Credit
²⁰¹⁶ Jan.	1	Balance				202,300
Dec.	31	Net income		108,000		310,300
	31	Cash dividends	28,000			282,300

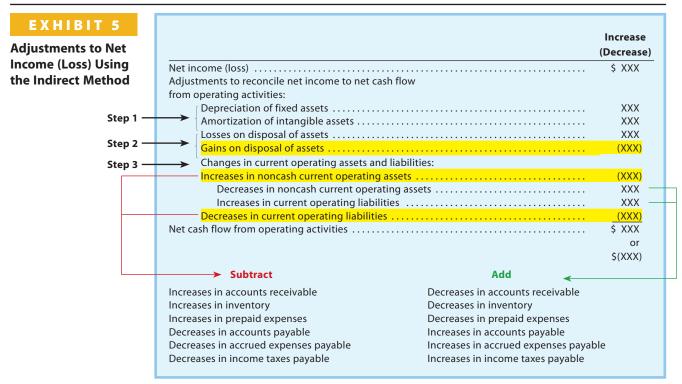
The retained earnings account indicates that the \$80,000 (\$108,000 - \$28,000) change resulted from net income of \$108,000 and cash dividends of \$28,000. The net income of \$108,000 is the first amount reported in the Cash Flows from Operating Activities section.

# **Adjustments to Net Income**

The net income of \$108,000 reported by **Rundell Inc.** does not equal the cash flows from operating activities for the period. This is because net income is determined using the accrual method of accounting.

Under the accrual method of accounting, revenues and expenses are recorded at different times from when cash is received or paid. For example, merchandise may be sold on account and the cash received at a later date. Likewise, insurance premiums may be paid in the current period but expensed in a following period.

Thus, under the indirect method, adjustments to net income must be made to determine cash flows from operating activities. The typical adjustments to net income are shown in Exhibit 5.³



³ Other items that also require adjustments to net income to obtain cash flows from operating activities include amortization of bonds payable discounts (add), losses on debt retirement (add), amortization of bonds payable premiums (deduct), and gains on retirement of debt (deduct).

Net income is normally adjusted to cash flows from operating activities, using the following steps:

 Step 1. Expenses that do not affect cash are added. Such expenses decrease net income but do not involve cash payments and, thus, are added to net income.

Example: Depreciation of fixed assets and amortization of intangible assets are added to net income.

• Step 2. Losses on the disposal of assets are added and gains on the disposal of assets are deducted. The disposal (sale) of assets is an investing activity rather than an operating activity. However, such losses and gains are reported as part of net income. As a result, any *losses* on disposal of assets are *added* back to net income. Likewise, any *gains* on disposal of assets are *deducted* from net income.

Example: Land costing \$100,000 is sold for \$90,000. The loss of \$10,000 is added back to net income.

- Step 3. Changes in current operating assets and liabilities are added or deducted as follows:
  - Increases in noncash current operating assets are deducted.
  - Decreases in noncash current operating assets are added.
  - · Increases in current operating liabilities are added.
  - Decreases in current operating liabilities are deducted.

Example: A sale of \$10,000 on account increases sales, accounts receivable, and net income by \$10,000. However, cash is not affected. Thus, the \$10,000 increase in accounts receivable is deducted. Similar adjustments are required for the changes in the other current asset and liability accounts, such as inventory, prepaid expenses, accounts payable, accrued expenses payable, and income taxes payable, as shown in Exhibit 5.

## Example Exercise 14-2 Adjustments to Net Income—Indirect Method



Omni Corporation's accumulated depreciation increased by \$12,000, while \$3,400 of patent amortization was recognized between balance sheet dates. There were no purchases or sales of depreciable or intangible assets during the year. In addition, the income statement showed a gain of \$4,100 from the sale of land. Reconcile Omni's net income of \$50,000 to net cash flow from operating activities.

Follow My Example 14-2		
Net income	\$50,000	
Adjustments to reconcile net income to net cash flow from operating activities:		
Depreciation	12,000	
Amortization of patents	3,400	
Gain from sale of land	(4,100)	
Net cash flow from operating activities	\$61,300	

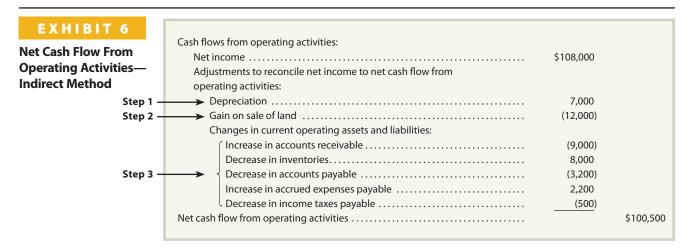
Practice Exercises: PE 14-2A, PE 14-2B

The Cash Flows from Operating Activities section of **Rundell Inc.'s** statement of cash flows is shown in Exhibit 6.

Rundell's net income of \$108,000 is converted to cash flows from operating activities of \$100,500 as follows:

Step 1. Add depreciation of \$7,000.

Fallow My Evennels 14 2



Analysis: The comparative balance sheet in Exhibit 4 indicates that Accumulated Depreciation—Building increased by \$7,000. The following account indicates that depreciation for the year was \$7,000 for the building:

Ac	Account Account Account No.						
						Balance	
	Date	•	Item	Debit	Credit	Debit	Credit
	Jan. Dec.	1 31	Balance Depreciation for year		7,000		58,300 65,300

- Step 2. Deduct the gain on the sale of land of \$12,000.

  Analysis: The income statement in Exhibit 4 reports a gain of \$12,000 from the sale of land. The proceeds, which include the gain, are reported in the Investing section of the statement of cash flows. Thus, the gain of \$12,000 is deducted from net income in determining cash flows from operating activities.
- Step 3. Add and deduct changes in current operating assets and liabilities excluding cash. Analysis: The increases and decreases in the current operating asset and current liability accounts excluding cash are as follows:

	Decem	Increase	
Accounts	2016	2015	Decrease*
Accounts Receivable (net)	\$ 74,000	\$ 65,000	\$9,000
Inventories	172,000	180,000	8,000*
Accounts Payable (merchandise creditors)	43,500	46,700	3,200*
Accrued Expenses Payable (operating expenses)	26,500	24,300	2,200
Income Taxes Payable	7,900	8,400	500*

Accounts receivable (net): The \$9,000 increase is deducted from net income. This is because the \$9,000 increase in accounts receivable indicates that sales on account were \$9,000 more than the cash received from customers. Thus, sales (and net income) includes \$9,000 that was not received in cash during the year.

*Inventories:* The \$8,000 decrease is added to net income. This is because the \$8,000 decrease in inventories indicates that the cost of merchandise *sold* exceeds the cost of the merchandise *purchased* during the year by \$8,000. In other words, the cost of merchandise sold includes \$8,000 of goods from inventory that were not purchased (used cash) during the year.

Accounts payable (merchandise creditors): The \$3,200 decrease is deducted from net income. This is because a decrease in accounts payable indicates that the cash

⁴The reporting of the proceeds (cash flows) from the sale of land as part of investing activities is discussed later in this chapter.

payments to merchandise creditors exceed the merchandise purchased on account by \$3,200. Therefore, the cost of merchandise sold is \$3,200 less than the cash paid to merchandise creditors during the year.

Accrued expenses payable (operating expenses): The \$2,200 increase is added to net income. This is because an increase in accrued expenses payable indicates that operating expenses exceed the cash payments for operating expenses by \$2,200. In other words, operating expenses reported on the income statement include \$2,200 that did not require a cash outflow during the year.

*Income taxes payable:* The \$500 decrease is deducted from net income. This is because a decrease in income taxes payable indicates that taxes paid exceed the amount of taxes incurred during the year by \$500. In other words, the amount reported on the income statement for income tax expense is less than the amount paid by \$500.

# Example Exercise 14-3 Changes in Current Operating Assets and Liabilities—Indirect Method



Victor Corporation's current operating assets and liabilities from the company's comparative balance sheet were as follows:

	Dec. 31, 2016	Dec. 31, 2015
Accounts receivable	\$ 6,500	\$ 4,900
Inventory	12,300	15,000
Accounts payable	4,800	5,200
Dividends payable	5,000	4,000

Adjust Victor's net income of \$70,000 for changes in operating assets and liabilities to arrive at cash flows from operating activities.

#### Follow My Example 14-3

Net income	\$70,000
Adjustments to reconcile net income to net cash flow from operating activities:	
Changes in current operating assets and liabilities:	
Increase in accounts receivable	(1,600)
Decrease in inventory	2,700
Decrease in accounts payable	(400)
Net cash flow from operating activities	\$70,700

Note: The change in dividends payable impacts the cash paid for dividends, which is disclosed under financing activities.

Practice Exercises: PE 14-3A, PE 14-3B

Using the preceding analyses, Rundell's net income of \$108,000 is converted to cash flows from operating activities of \$100,500 as shown in Exhibit 6.

## Integrity, Objectivity, and Ethics in Business



#### **CREDIT POLICY AND CASH FLOW**

Investors frequently use net cash flow from operating activities to assess a company's financial health. If a company is financially healthy, net cash flow from operating activities should be roughly consistent with accrual basis net income. Questions arise, however, when a company's net cash flow from operating activities significantly lags net income. There are two scenarios which can cause this to happen:

· Sales on account are never collected in cash.

 Large cash purchases for inventory are never sold, or sell at a very slow pace.

Both of these scenarios increase net income, without a corresponding increase in net cash flow from operating activities. Prudent investors are often skeptical when they observe these scenarios and tend to avoid these types of investments until the cash flows become clear.

Source: Argersinger, M., "How Companies Fake It (With Cash Flow)," Daily Finance Investor Center, July 17, 2011.

## Example Exercise 14-4 Cash Flows from Operating **Activities—Indirect Method**



Omicron Inc. reported the following data:

Net income \$120,000 Depreciation expense 12,000 Loss on disposal of equipment 15,000 Increase in accounts receivable 5,000 Decrease in accounts payable 2,000

Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method.

Follow M	y Examp	le 14-4
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Cash flows from operating activities:		
Net income	\$120,000	
Adjustments to reconcile net income to net cash flow		
from operating activities:		
Depreciation expense	12,000	
Loss on disposal of equipment	15,000	
Changes in current operating assets and liabilities:		
Increase in accounts receivable	(5,000)	
Decrease in accounts payable	(2,000)	
Net cash flow from operating activities		\$140,000

Practice Exercises: PE 14-4A, PE 14-4B

## **Dividends**

The retained earnings account of Rundell Inc. indicates cash dividends of \$28,000 were declared during the year. However, the following dividends payable account indicates that only \$24,000 of dividends were paid during the year:

Ac	Account Dividends Payable Account No.								
	Date					Bala	ance		
			Item	Debit	Credit	Debit	Credit		
	²⁰¹⁶ Jan.	1	Balance				10,000		
		10	Cash paid	10,000		_	_		
	June	20	Dividends declared		14,000		14,000		
	July	10	Cash paid	14,000		_	_		
	Dec.	20	Dividends declared		14,000		14,000		

Because dividend payments are a financing activity, the dividend payment of \$24,000 is reported in the Financing Activities section of the statement of cash flows, as follows:

> Cash flows from financing activities: Cash paid for dividends..... \$24,000

## **Common Stock**

The common stock account of **Rundell Inc.** increased by \$8,000, and the paid-in capital in excess of par—common stock account increased by \$40,000, as follows:

A	Account Common Stock Account No.								
	Date					Balance			
			Item	Debit	Credit	Debit	Credit		
	Jan. Nov.	1	Balance 4,000 shares issued for cash		8,000		16,000 24,000		

Account Paid-In Capital in Excess of Par—Common Stock Account No.								
						Bala	ance	
	Date		Item	Debit	Credit	Debit	Credit	
	Jan. Nov.	1	Balance 4,000 shares issued for cash		40,000		80,000 120,000	

These increases were from issuing 4,000 shares of common stock for \$12 per share. This cash inflow is reported in the Financing Activities section as follows:

## **Bonds Payable**

The bonds payable account of Rundell Inc. decreased by \$50,000, as follows:

Account Bonds Payable Account No.							
					Bala	ance	
Date	•	ltem	Debit	Credit	Debit	Credit	
Jan. June	1	Balance Retired by payment of cash				150,000	
June	•	at face amount	50,000			100,000	

This decrease is from retiring the bonds by a cash payment for their face amount. This cash outflow is reported in the Financing Activities section as follows:

## **Building**

The building account of **Rundell Inc.** increased by \$60,000, and the accumulated depreciation—building account increased by \$7,000, as follows:

Account Building Account N						ccount No.
					Bala	nce
Date	e	ltem	Debit	Credit	Debit	Credit
Jan. Dec.	1 27	Balance Purchased for cash	60,000		200,000	

Account Accumulated Depreciation—Building Accou							ccount No.	
						Bala	Balance	
	Date	•	ltem	Debit	Credit	Debit	Credit	
	Jan. Dec.	1 31	Balance Depreciation for the year		7,000		58,300 65,300	

The purchase of a building for cash of \$60,000 is reported as an outflow of cash in the Investing Activities section as follows:

The credit in the accumulated depreciation—building account represents depreciation expense for the year. This depreciation expense of \$7,000 on the building was added to net income in determining cash flows from operating activities, as reported in Exhibit 6.

#### Land

The \$45,000 decline in the land account of **Rundell Inc.** was from two transactions, as follows:

Account Land Account No.								
					Bala	ince		
D	ate	ltem	Debit	Credit	Debit	Credit		
Jan	n. 1	Balance		60.000	125,000			
Jur Oct		Sold for \$72,000 cash Purchased for \$15,000 cash	15,000	60,000	65,000 80,000			

The June 8 transaction is the sale of land with a cost of \$60,000 for \$72,000 in cash. The \$72,000 proceeds from the sale are reported in the Investing Activities section as follows:

The proceeds of \$72,000 include the \$12,000 gain on the sale of land and the \$60,000 cost (book value) of the land. As shown in Exhibit 6, the \$12,000 gain is deducted from net income in the Cash Flows from Operating Activities section. This is so that the \$12,000 cash inflow related to the gain is not included twice as a cash inflow.

\$15,000

The October 12 transaction is the purchase of land for cash of \$15,000. This transaction is reported as an outflow of cash in the Investing Activities section as follows:

#### Example Exercise 14-5 Land Transactions on the Statement of Cash Flows

**○**BJ **2** 

Alpha Corporation purchased land for \$125,000. Later in the year, the company sold a different piece of land with a book value of \$165,000 for \$200,000. How are the effects of these transactions reported on the statement of cash flows?

## Follow My Example 14-5

The gain on the sale of the land is deducted from net income, as follows:

The purchase and sale of land is reported as part of cash flows from investing activities, as follows:

Cash received from sale of land \$200,000
Cash paid for purchase of land (125,000)

Practice Exercises: PE 14-5A, PE 14-5B

## **Preparing the Statement of Cash Flows**

The statement of cash flows for **Rundell Inc.**, using the indirect method, is shown in Exhibit 7. The statement of cash flows indicates that cash increased by \$71,500 during the year. The most significant increase in net cash flows (\$100,500) was from operating activities. The most significant use of cash (\$26,000) was for financing activities. The ending balance of cash on December 31, 2016, is \$97,500. This ending cash balance is also reported on the December 31, 2016, balance sheet shown in Exhibit 4.

Rundell Inc. Statement of Cash Flows For the Year Ended December 31, 2016								
Cash flows from operating activities:  Net income		\$108,000						
Depreciation		7,000 (12,000)						
Increase in accounts receivable		(9,000) 8,000 (3,200)						
Increase in accrued expenses payable  Decrease in income taxes payable  Net cash flow from operating activities  Cash flows from investing activities:		2,200 (500)	\$100,500					
Cash received from sale of land  Less: Cash paid for purchase of land  Cash paid for purchase of building	\$15,000 60,000	\$ 72,000 75,000						
Net cash flow used for investing activities  Cash flows from financing activities:  Cash received from sale of common stock		\$ 48,000	(3,000)					
Less: Cash paid to retire bonds payable	\$50,000 <u>24,000</u>	74,000	(26,000) \$ 71,500					
Cash at the beginning of the year			<u>26,000</u> \$ 97,500					

#### **EXHIBIT 7**

Statement of Cash Flows—Indirect Method



## Preparing the Statement of Cash Flows— The Direct Method

The direct method reports cash flows from operating activities as follows:

Cash flows from operating activities:

Cash received from customers		\$ XXX
Less: Cash payments for merchandise	\$ XXX	
Cash payments for operating expenses	XXX	
Cash payments for interest	XXX	
Cash payments for income taxes	XXX	XXX
Net cash flow from operating activities		\$ XXX

The Cash Flows from Investing and Financing Activities sections of the statement of cash flows are exactly the same under both the direct and indirect methods. The amount of net cash flow from operating activities is also the same, but the manner in which it is reported is different.

Under the direct method, the income statement is adjusted to cash flows from operating activities as shown in Exhibit 8.

#### **EXHIBIT 8**

Converting Income Statement to Cash Flows from Operating Activities using the Direct Method

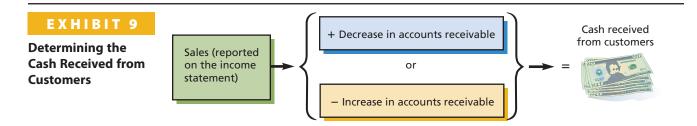
Adjusted to	<b>Cash Flows from Operating Activities</b>
$\rightarrow$	Cash received from customers
$\rightarrow$	Cash payments for merchandise
N/A	N/A
$\rightarrow$	Cash payments for operating expenses
N/A	N/A
$\rightarrow$	Cash payments for interest
$\rightarrow$	Cash payments for income taxes
$\rightarrow$	Net cash flow from operating activities
	→ → N/A → N/A → → →

As shown in Exhibit 8, depreciation expense is not adjusted or reported as part of cash flows from operating activities. This is because deprecation expense does not involve a cash outflow. The gain on the sale of the land is also not adjusted and is not reported as part of cash flows from operating activities. This is because the cash flow from operating activities is determined directly, rather than by reconciling net income. The cash proceeds from the sale of the land are reported as an investing activity.

To illustrate the direct method, the income statement and comparative balance sheet for Rundell Inc., shown in Exhibit 4, are used.

#### **Cash Received from Customers**

The income statement (shown in Exhibit 4) of **Rundell Inc.** reports sales of \$1,180,000. To determine the cash received from customers, the \$1,180,000 is adjusted for any increase or decrease in accounts receivable. The adjustment is summarized in Exhibit 9.



Practice Exercises: PE 14-6A, PE 14-6B

The cash received from customers is \$1,171,000, computed as follows:

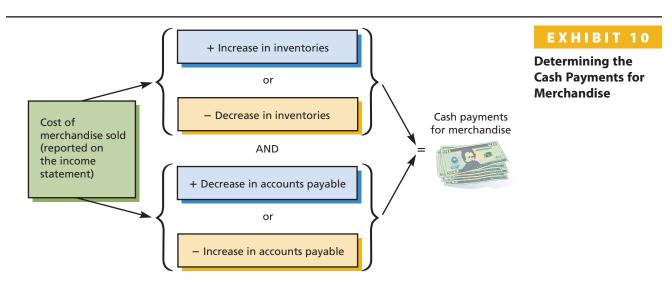
Sales	\$1,180,000
Less increase in accounts receivable	9,000
Cash received from customers	\$1,171,000

The increase of \$9,000 in accounts receivable (shown in Exhibit 4) during 2016 indicates that sales on account exceeded cash received from customers by \$9,000. In other words, sales include \$9,000 that did not result in a cash inflow during the year. Thus, \$9,000 is deducted from sales to determine the cash received from customers.

# Example Exercise 14-6 Cash Received from Customers—Direct Method Sales reported on the income statement were \$350,000. The accounts receivable balance declined \$8,000 over the year. Determine the amount of cash received from customers. Follow My Example 14-6 Sales \$350,000 Add decrease in accounts receivable \$8,000 Cash received from customers. \$350,000 \$\$350,000

## **Cash Payments for Merchandise**

The income statement (shown in Exhibit 4) for **Rundell Inc.** reports cost of merchandise sold of \$790,000. To determine the cash payments for merchandise, the \$790,000 is adjusted for any increases or decreases in inventories and accounts payable. Assuming the accounts payable are owed to merchandise suppliers, the adjustment is summarized in Exhibit 10.



The cash payments for merchandise are \$785,200, computed as follows:

Cost of merchandise sold	\$790,000
Deduct decrease in inventories	(8,000)
Add decrease in accounts payable	3,200
Cash payments for merchandise	\$785,200

The \$8,000 decrease in inventories (from Exhibit 4) indicates that the merchandise sold exceeded the cost of the merchandise purchased by \$8,000. In other words, the cost of merchandise sold includes \$8,000 of goods sold from inventory that did not require a cash outflow during the year. Thus, \$8,000 is deducted from the cost of merchandise sold in determining the cash payments for merchandise.

The \$3,200 decrease in accounts payable (from Exhibit 4) indicates that cash payments for merchandise were \$3,200 more than the purchases on account during 2016. Therefore, \$3,200 is added to the cost of merchandise sold in determining the cash payments for merchandise.

#### Example Exercise 14-7 Cash Payments for Merchandise—Direct Method



The cost of merchandise sold reported on the income statement was \$145,000. The accounts payable balance increased by \$4,000, and the inventory balance increased by \$9,000 over the year. Determine the amount of cash paid for merchandise.

#### Follow My Example 14-7

Cost of merchandise sold	\$145,000
Add increase in inventories	9,000
Deduct increase in accounts payable	(4,000)
Cash paid for merchandise	\$150,000

Practice Exercises: PE 14-7A, PE 14-7B

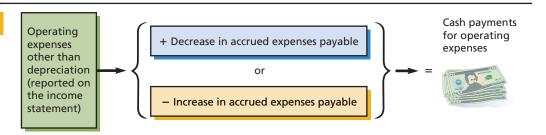
## **Cash Payments for Operating Expenses**

The income statement for **Rundell Inc.** (from Exhibit 4) reports total operating expenses of \$203,000, which includes depreciation expense of \$7,000. Because depreciation expense does not require a cash outflow, it is omitted from cash payments for operating expenses.

To determine the cash payments for operating expenses, the other operating expenses (excluding depreciation) of \$196,000 (\$203,000 - \$7,000) are adjusted for any increase or decrease in accrued expenses payable. Assuming that the accrued expenses payable are all operating expenses, this adjustment is summarized in Exhibit 11.

#### **EXHIBIT 11**

Determining the Cash Payments for Operating Expenses



The cash payments for operating expenses are \$193,800, computed as follows:

Operating expenses other than depreciation \$196,000

Deduct increase in accrued expenses payable (2,200)

Cash payments for operating expenses \$193,800

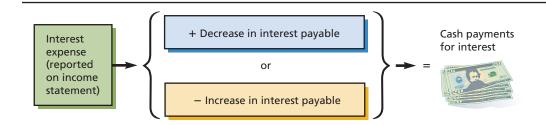
The increase in accrued expenses payable (from Exhibit 4) indicates that the cash payments for operating expenses were \$2,200 less than the amount reported for operating expenses during the year. Thus, \$2,200 is deducted from the operating expenses in determining the cash payments for operating expenses.

#### **Gain on Sale of Land**

The income statement for **Rundell Inc.** (from Exhibit 4) reports a gain of \$12,000 on the sale of land. The sale of land is an investing activity. Thus, the proceeds from the sale, which include the gain, are reported as part of the cash flows from investing activities.

## **Interest Expense**

The income statement for **Rundell Inc.** (from Exhibit 4) reports interest expense of \$8,000. To determine the cash payments for interest, the \$8,000 is adjusted for any increases or decreases in interest payable. The adjustment is summarized in Exhibit 12.



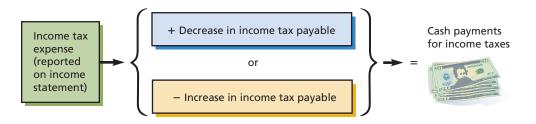
#### **EXHIBIT 12**

Determining the Cash Payments for Interest

The comparative balance sheet of Rundell in Exhibit 4 indicates no interest payable. This is because the interest expense on the bonds payable is paid on June 1 and December 31. Because there is no interest payable, no adjustment of the interest expense of \$8,000 is necessary.

## **Cash Payments for Income Taxes**

The income statement for **Rundell Inc.** (from Exhibit 3) reports income tax expense of \$83,000. To determine the cash payments for income taxes, the \$83,000 is adjusted for any increases or decreases in income taxes payable. The adjustment is summarized in Exhibit 13.



#### **EXHIBIT 13**

Determining the Cash Payments for Income Taxes

The cash payments for income taxes are \$83,500, computed as follows:

Income tax expense	\$83,000
Add decrease in income taxes payable	500
Cash payments for income taxes	\$83,500

The \$500 decrease in income taxes payable (from Exhibit 4) indicates that the cash payments for income taxes were \$500 more than the amount reported for income tax expense during 2016. Thus, \$500 is added to the income tax expense in determining the cash payments for income taxes.

## **Reporting Cash Flows from Operating Activities**—Direct Method

The statement of cash flows for Rundell Inc., using the direct method for reporting cash flows from operating activities, is shown in Exhibit 14. The portions of the statement that differ from those prepared under the indirect method are highlighted.

#### **EXHIBIT 14**

**Statement of Cash** Flows—Direct Method

Rundell Inc. Statement of Cash Flo For the Year Ended Decembe			
Cash flows from operating activities:  Cash received from customers  Deduct: Cash payments for merchandise.  Cash payments for operating expenses  Cash payments for interest	\$785,200 193,800 8,000	\$1,171,000	
Cash payments for income taxes	83,500	1,070,500	
Net cash flow from operating activities			\$100,500
Cash flows from investing activities:  Cash received from sale of land  Less: Cash paid for purchase of land  Cash paid for purchase of building  Net cash flow used for investing activities.  Cash flows from financing activities:	\$ 15,000 60,000	\$ 72,000 	(3,000)
Cash received from sale of common stock  Less: Cash paid to retire bonds payable  Cash paid for dividends	\$ 50,000 	\$ 48,000	(0.5.0.0.)
Net cash flow used for financing activities			(26,000) \$ 71,500
Cash at the beginning of the year			26,000
Cash at the end of the year			\$ 97,500
Schedule Reconciling Net Income with Cash			
Flows from Operating Activities:			
Cash flows from operating activities:  Net income			\$108,000
Depreciation			7,000
Gain on sale of land			(12,000)
Increase in accounts receivable			(9,000)
Decrease in inventory			8,000
Decrease in accounts payable			(3,200)
Increase in accrued expenses payable			2,200
Decrease in income taxes payable			(500)
Net cash flow from operating activities			\$100,500

Exhibit 14 also includes the separate schedule reconciling net income and net cash flow from operating activities. This schedule is included in the statement of cash flows when the direct method is used. This schedule is similar to the Cash Flows from Operating Activities section prepared under the indirect method.

## International 🎇 Connection



## IFRS FOR STATEMENT OF CASH **FLOWS**

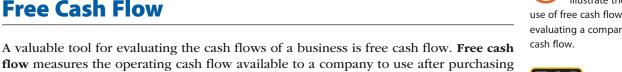
The statement of cash flows is required under International Financial Reporting Standards (IFRS). The statement of cash flows under IFRS is similar to that reported under U.S. GAAP in that the statement has separate sections for operating, investing, and financing activities. Like U.S. GAAP, IFRS also allow the use of either the indirect or direct method of reporting cash flows from operating activities. IFRS differ from U.S. GAAP in some minor areas, including:

- Interest paid can be reported as either an operating or a financing activity, while interest received
- * IFRS are further discussed and illustrated in this chapter and in Appendix C.

capacity.⁵ It is computed as follows:

- can be reported as either an operating or an investing activity. In contrast, U.S. GAAP reports interest paid or received as an operating activity.
- Dividends paid can be reported as either an operating or a financing activity, while dividends received can be reported as either an operating or an investing activity. In contrast, U.S. GAAP reports dividends paid as a financing activity and dividends received as an operating activity.
- Cash flows to pay taxes are reported as a separate line in the operating activities, in contrast to U.S. GAAP, which does not require a separate line disclosure.

## **Financial Analysis and Interpretation: Free Cash Flow**



\$XXX Cash flow from operating activities Less: Investments in PP&E needed to maintain current production XXX \$XXX

the property, plant, and equipment (PP&E) necessary to maintain current productive

Analysts often use free cash flow, rather than cash flows from operating activities, to measure the financial strength of a business. Industries such as airlines, railroads, and telecommunications companies must invest heavily in new equipment to remain competitive. Such investments can significantly reduce free cash flow. For example, Verizon Communications Inc.'s free cash flow is approximately 51% of the cash flow from operating activities. In contrast, Apple Inc.'s free cash flow is approximately 89% of the cash flow from operating activities.

To illustrate, the cash flow from operating activities for Research in Motion, Inc., maker of BlackBerry® smartphones, was \$2,912 million in a recent fiscal year. The statement of cash flows indicated that the cash invested in property, plant, and equipment was \$902 million. Assuming that the amount invested in property, plant, and equipment is necessary to maintain productive capacity, free cash flow would be computed as follows (in millions):

> \$2,912 Cash flow from operating activities Less: Investments in PP&E needed to maintain current production 902 Free cash flow \$2,010

Research in Motion's free cash flow was 69% of cash flow from operations and more than 10% of sales. Compare this to the calculation of free cash flows for Apple Inc.





⁵ Productive capacity is the number of goods the company is currently producing and selling.

(a computer company), The Coca-Cola Company (a beverage company), and Verizon Communications, Inc. (a telecommunications company), that follows (in millions):

	Apple Inc.	The Coca-Cola Company	Verizon Communications, Inc.
Sales	\$156,508	\$48,017	\$115,846
Cash flow from operating activities	50,856	10,645	31,486
Less: Investments in PP&E needed			
to maintain current production	8,295	2,870	16,175
Free cash flow	\$ 42,561	\$ 7,775	\$ 15,311
Free cash flow as a percentage			
of cash flow from operations	84%	73%	49%
Free cash flow as a percentage of sales	27%	16%	13%

Positive free cash flow is considered favorable. A company that has free cash flow is able to fund internal growth, retire debt, pay dividends, and benefit from financial flexibility. A company with no free cash flow is unable to maintain current productive capacity. Lack of free cash flow can be an early indicator of liquidity problems. As one analyst notes, "Free cash flow gives the company firepower to reduce debt and ultimately generate consistent, actual income."

## Example Exercise 14-8 Free Cash Flow



Omnicron Inc. reported the following on the company's cash flow statement in 2016 and 2015:

	2016	2015
Net cash flow from operating activities	\$140,000	\$120,000
Net cash flow used for investing activities	(120,000)	(80,000)
Net cash flow used for financing activities	(20,000)	(32,000)

Seventy-five percent of the net cash flow used for investing activities was used to replace existing capacity.

- a. Determine Omnicron's free cash flow.
- b. Has Omnicron's free cash flow improved or declined from 2015 to 2016?

#### Follow My Example 14-8

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	2016	2015
Net cash flow from operating activities	\$140,000	\$120,000
Less: Investments in fixed assets to maintain current production	90,000 ¹	60,000 ²
Free cash flow	\$ 50,000	\$ 60,000

- ¹ \$120,000 × 75%
- 2  \$80,000 × 75%
- b. The change from \$60,000 to \$50,000 indicates an unfavorable trend.

Practice Exercises: PE 14-8A, PE 14-8B

⁶ Jill Krutick, Fortune, March 30, 1998, p. 106.

## A P P E N D I X

# Spreadsheet (Work Sheet) for Statement of Cash Flows—The Indirect Method

A spreadsheet (work sheet) may be used in preparing the statement of cash flows. However, whether or not a spreadsheet (work sheet) is used, the concepts presented in this chapter are not affected.

The data for **Rundell Inc.**, presented in Exhibit 4 are used as a basis for illustrating the spreadsheet (work sheet) for the indirect method. The steps in preparing this spreadsheet (work sheet), shown in Exhibit 15, are as follows:

- Step 1. List the title of each balance sheet account in the Accounts column.
- Step 2. For each balance sheet account, enter its balance as of December 31, 2015, in the first column and its balance as of December 31, 2016, in the last column. Place the credit balances in parentheses.
- Step 3. Add the December 31, 2015 and 2016 column totals, which should total to zero.
- Step 4. Analyze the change during the year in each noncash account to determine its net increase (decrease) and classify the change as affecting cash flows from operating activities, investing activities, financing activities, or noncash investing and financing activities.
- Step 5. Indicate the effect of the change on cash flows by making entries in the Transactions columns.
- Step 6. After all noncash accounts have been analyzed, enter the net increase (decrease) in cash during the period.
- Step 7. Add the Debit and Credit Transactions columns. The totals should be equal.

## **Analyzing Accounts**

In analyzing the noncash accounts (Step 4), try to determine the type of cash flow activity (operating, investing, or financing) that led to the change in the account. As each noncash account is analyzed, an entry (Step 5) is made on the spreadsheet (work sheet) for the type of cash flow activity that caused the change. After all noncash accounts have been analyzed, an entry (Step 6) is made for the increase (decrease) in cash during the period.

The entries made on the spreadsheet are not posted to the ledger. They are only used in preparing and summarizing the data on the spreadsheet.

The order in which the accounts are analyzed is not important. However, it is more efficient to begin with Retained Earnings and proceed upward in the account listing.

## **Retained Earnings**

The spreadsheet (work sheet) shows a Retained Earnings balance of \$202,300 at December 31, 2015, and \$282,300 at December 31, 2016. Thus, Retained Earnings increased \$80,000 during the year. This increase is from the following:

- Net income of \$108,000
- Declaring cash dividends of \$28,000

To identify the cash flows from these activities, two entries are made on the spreadsheet.

#### **EXHIBIT 15**

#### End-of-Period Spreadsheet (Work Sheet) for Statement of Cash Flows—Indirect Method

	А	В	C	D	E	F	G
1		undell Inc.		•			
2	End-of-Period Spreadsheet (W				sh F	lows	
3		nded December 3	1, 20				
4	Accounts	Balance,	_	Transa	actio		Balance,
5		Dec. 31, 201	_	Debit		Credit	Dec. 31, 2016
_	Cash	26,000					97,500
7	Accounts receivable (net) Inventories	65,000 180.000	- ' '	9,000	(m)	8,000	74,000 172,000
_	Land	125,000		15,000	(III)	.,	80,000
_	Building	200,000			(1)	00,000	260,000
	Accumulated depreciation—building	(58,300	U/	00,000	(i)	7,000	(65,300)
12	Accounts payable (merchandise creditors)	(46,700		3,200	(-)	1,000	(43,500)
13	Accrued expenses payable (operating expenses)	(24,300		,	(g)	2,200	(26,500)
	Income taxes payable	(8,400		500			(7,900)
	Dividends payable	(10,000			(e)	4,000	(14,000)
	Bonds payable	(150,000		50,000			(100,000)
	Common stock	(16,000			(c)		(24,000)
	Paid-in capital in excess of par	(80,000		00.000	(c)	· ·	(120,000)
	Retained earnings	(202,300	+		(a)	108,000	(282,300)
21	Totals Step 3 Operating activities:	3	_	237,200		237,200	0
22	Net income		(2)	108,000			
23	Depreciation of building		(i)				
24	Gain on sale of land		(.,	1,000	(I)	12,000	
25	Increase in accounts receivable				(n)		
26	Decrease in inventories		(m)	8,000			
27	Decrease in accounts payable				(h)	3,200	
28	Increase in accrued expenses payable		(g)	2,200			
29	Decrease in income taxes payable				(f)	500	
	Investing activities:		/**	70.000			
31	Sale of land		(I)	72,000	(1.)	45.000	
32	Purchase of land Purchase of building		-		(k)		
	Financing activities:				(j)	60,000	
35	Issued common stock		(c)	48,000			
36	Retired bonds payable		(0)	40,000	(d)	50,000	
37	Declared cash dividends		+		(b)		
38	Increase in dividends payable		(e)	4,000	(~)		
39	Net increase in cash				(0)	71,500	
40	Totals			249,200		249,200	
		·	t				J

The \$108,000 is reported on the statement of cash flows as part of cash flows from operating activities. Thus, an entry is made in the Transactions columns on the spreadsheet, as follows:

(a)	Operating Activities—Net Income	108,000	
	Retained Earnings		108,000

The preceding entry accounts for the net income portion of the change to Retained Earnings. It also identifies the cash flow in the bottom portion of the spreadsheet as related to operating activities.

The \$28,000 of dividends is reported as a financing activity on the statement of cash flows. Thus, an entry is made in the Transactions columns on the spreadsheet, as follows:

(b)	Retained Earnings	28,000	
	Financing Activities—Declared Cash Dividends		28,000

The preceding entry accounts for the dividends portion of the change to Retained Earnings. It also identifies the cash flow in the bottom portion of the spreadsheet as related to financing activities. The \$28,000 of declared dividends will be adjusted later for the actual amount of cash dividends paid during the year.

#### **Other Accounts**

The entries for the other noncash accounts are made in the spreadsheet in a manner similar to entries (a) and (b). A summary of these entries follows:

(c)	Financing Activities—Issued Common Stock	48,000	
	Common Stock		8,000
	Paid-In Capital in Excess of Par—Common Stock		40,000
(d)	Bonds Payable	50,000	
	Financing Activities—Retired Bonds Payable		50,000
(e)	Financing Activities—Increase in Dividends Payable	4,000	•
. ,	Dividends Payable	·	4,000
(f)	Income Taxes Payable	500	
. ,	Operating Activities—Decrease in Income Taxes Payable		500
(g)	Operating Activities—Increase in Accrued Expenses Payable	2,200	
.5,	Accrued Expenses Payable	·	2,200
(h)	Accounts Payable	3,200	,
. ,	Operating Activities—Decrease in Accounts Payable	,	3,200
(i)	Operating Activities—Depreciation of Building	7,000	-,
(-)	Accumulated Depreciation—Building	1,000	7,000
(j)	Building	60,000	.,
()/	Investing Activities—Purchase of Building		60,000
(k)	Land	15,000	00,000
(14)	Investing Activities—Purchase of Land	13,000	15,000
(I)	Investing Activities—Sale of Land.	72,000	13,000
(1)	Operating Activities—Gain on Sale of Land	72,000	12,000
	Land		60,000
(m)	Operating Activities—Decrease in Inventories.	8,000	00,000
(111)	Inventories.	0,000	8,000
(n)	Accounts Receivable	9,000	0,000
(11)	Operating Activities—Increase in Accounts Receivable	9,000	9,000
(o)	Cash	71,500	9,000
(0)	Net Increase in Cash.	71,300	71,500
	ווכנ וווכופמספ ווו כמסוו		71,500

After all the balance sheet accounts are analyzed and the entries made on the spreadsheet (work sheet), all the operating, investing, and financing activities are identified in the bottom portion of the spreadsheet. The accuracy of the entries is verified by totaling the Debit and Credit Transactions columns. The totals of the columns should be equal.

## **Preparing the Statement of Cash Flows**

The statement of cash flows prepared from the spreadsheet is identical to the statement in Exhibit 7. The data for the three sections of the statement are obtained from the bottom portion of the spreadsheet.

# At a Glance 14



#### Describe the cash flow activities reported in the statement of cash flows.

**Key Points** The statement of cash flows reports cash receipts and cash payments by three types of activities: operating activities, investing activities, and financing activities. Cash flows from operating activities reports the cash inflows and outflows from a company's day-to-day operations. Cash flows from investing activities reports the cash inflows and outflows related to changes in a company's long-term assets. Cash flows from financing activities reports the cash inflows and outflows related to changes in a company's long-term liabilities and stockholders' equity. Investing and financing for a business may be affected by transactions that do not involve cash. The effect of such transactions should be reported in a separate schedule accompanying the statement of cash flows.

Learning Outcome	Example Exercises	Practice Exercises
• Classify transactions that either provide or use cash into either operating, investing, or financing activities.	EE14-1	PE14-1A, 14-1B



#### Prepare a statement of cash flows, using the indirect method.

**Key Points** The indirect method reports cash flows from operating activities by adjusting net income for revenues and expenses that do not involve the receipt or payment of cash. Noncash expenses such as depreciation are added back to net income. Gains and losses on the disposal of assets are added to or deducted from net income. Changes in current operating assets and liabilities are added to or subtracted from net income, depending on their effect on cash. Cash flows from investing activities and cash flows from financing activities are reported below cash flows from operating activities in the statement of cash flows.

Learning Outcomes	Example Exercises	Practice Exercises
• Determine cash flows from operating activities under the indirect method by adjusting net income for noncash expenses and gains and losses from asset disposals.	EE14-2	PE14-2A, 14-2B
<ul> <li>Determine cash flows from operating activities under the indirect method by adjusting net income for changes in current operating assets and liabilities.</li> </ul>	EE14-3	PE14-3A, 14-3B
• Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method.	EE14-4	PE14-4A, 14-4B
• Prepare the Cash Flows from Investing Activities and Cash Flows from Financing Activities sections of the statement of cash flows.	EE14-5	PE14-5A, 14-5B



#### Prepare a statement of cash flows, using the direct method.

**Key Points** The amount of cash flows from operating activities is the same under both the direct and indirect methods, but the manner in which cash flows operating activities is reported is different. The direct method reports cash flows from operating activities by major classes of operating cash receipts and cash payments. The difference between the major classes of total operating cash receipts and total operating cash payments is the net cash flow from operating activities. The Cash Flows from Investing and Financing Activities sections of the statement are the same under both the direct and indirect methods.

Learning Outcome	Example Exercises	Practice Exercises
Prepare the cash flows from operating activities section of the	EE14-6	PE14-6A, 14-6B
statement of cash flows under the direct method.	EE14-7	PE14-7A, 14-7B



#### Describe and illustrate the use of free cash flow in evaluating a company's cash flow.

**Key Points** Free cash flow measures the operating cash flow available for company use after purchasing the fixed assets that are necessary to maintain current productive capacity. It is calculated by subtracting these fixed asset purchases from net cash flow from operating activities. A company with strong free cash flow is able to fund internal growth, retire debt, pay dividends, and enjoy financial flexibility. A company with weak free cash flow has much less financial flexibility.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe free cash flow.		
Calculate and evaluate free cash flow.	EE14-8	PE14-8A, 14-8B

## **Key Terms**

cash flow per share (646) cash flows from financing activities (643) cash flows from investing activities (642) cash flows from operating activities (642) direct method (643) free cash flow (661)

indirect method (644) statement of cash flows (642)

## **Illustrative Problem**

The comparative balance sheet of Dowling Company for December 31, 2016 and 2015, is as follows:

Dowling Company Comparative Balance Sheet December 31, 2016 and 2015		
	2016	2015
Assets		
Cash	\$ 140,350	\$ 95,900
Accounts receivable (net)	95,300	102,300
Inventories	165,200	157,900
Prepaid expenses	6,240	5,860
Investments (long-term)	35,700	84,700
Land	75,000	90,000
Buildings	375,000	260,000
Accumulated depreciation—buildings	(71,300)	(58,300)
Machinery and equipment	428,300	428,300
Accumulated depreciation—machinery and equipment	(148,500)	(138,000)
Patents	58,000	65,000
Total assets	\$1,159,290	\$1,093,660
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 43,500	\$ 46,700
Accrued expenses payable (operating expenses)	14,000	12,500
Income taxes payable	7,900	8,400
Dividends payable	14,000	10,000
Mortgage note payable, due 2023	40,000	0
Bonds payable	150,000	250,000
Common stock, \$30 par	450,000	375,000
Excess of issue price over par—common stock	66,250	41,250
Retained earnings	373,640	349,810
Total liabilities and stockholders' equity	\$1,159,290	\$1,093,660

The income statement for Dowling Company follows:

Dowling Company Income Statement For the Year Ended December 31, 2016			
Sales		\$1,100,000	
Cost of merchandise sold		710,000	
Gross profit		\$ 390,000	
Operating expenses:			
Depreciation expense	23,500		
Patent amortization	7,000		
Other operating expenses	196,000		
Total operating expenses		226,500	
Income from operations		\$ 163,500	
Other income:			
Gain on sale of investments\$	11,000		
Other expense:			
Interest expense	26,000	(15,000)	
Income before income tax		\$ 148,500	
Income tax expense		50,000	
Net income		\$ 98,500	

An examination of the accounting records revealed the following additional information applicable to 2016:

- a. Land costing \$15,000 was sold for \$15,000.
- b. A mortgage note was issued for \$40,000.
- c. A building costing \$115,000 was constructed.
- d. 2,500 shares of common stock were issued at \$40 in exchange for the bonds payable.
- e. Cash dividends declared were \$74,670.

#### **Instructions**

- 1. Prepare a statement of cash flows, using the indirect method of reporting cash flows from operating activities.
- 2. Prepare a statement of cash flows, using the direct method of reporting cash flows from operating activities.

#### **Solution**

1.

Dowling Company Statement of Cash Flows—Indirect Met For the Year Ended December 31, 201		
Cash flows from operating activities:  Net income	\$ 98,500	
Adjustments to reconcile net income to net cash flow from operating activities:		
Depreciation	23,500	
Amortization of patents	7,000	
Gain on sale of investments	(11,000)	
Changes in current operating assets and liabilities:		
Decrease in accounts receivable	7,000	
Increase in inventories	(7,300)	
Increase in prepaid expenses	(380)	
Decrease in accounts payable	(3,200)	
Increase in accrued expenses payable	1,500	
Decrease in income taxes payable  Net cash flow from operating activities	(500)	\$115,120
Cash flows from investing activities:		\$115,120
Cash received from sale of:		
Investments \$60,0	00 ¹	
Land	00 \$ 75,000	
Less: Cash paid for construction of building	115,000	
Net cash flow used for investing activities		(40,000)
Cash flows from financing activities:		
Cash received from issuing mortgage note payable  Less: Cash paid for dividends	\$ 40,000 70,670 ²	
Net cash flow used for financing activities		(30,670)
Increase in cash		\$ 44,450
Cash at the beginning of the year		95,900
Cash at the end of the year		\$140,350
Schedule of Noncash Investing and Financing Activities:		
Issued common stock to retire bonds payable		\$100,000
¹ \$60,000 = \$11,000 gain + \$49,000 (decrease in investments)		
² \$70,670 = \$74,670 - \$4,000 (increase in dividends)		

2.

Dowling Compa Statement of Cash Flows—Di For the Year Ended Decemb	rect Method	ı	
Cash flows from operating activities:  Cash received from customers¹.  Deduct: Cash paid for merchandise².  Cash paid for operating expenses³.  Cash paid for interest expense  Cash paid for income tax⁴.  Net cash flow from operating activities  Cash flows from investing activities:	\$720,500 194,880 26,000 50,500	\$1,107,000	\$115,120
Cash received from sale of:	\$ 60,000 ⁵ 15,000	\$ 75,000 115,000 \$ 40,000 70,670	(40,000) (30,670) \$ 44,450 95,900 \$140,350
Schedule of Noncash Investing and Financing Activities: Issued common stock to retire bonds payable Schedule Reconciling Net Income with Cash Flows from Operating Activities ⁷			\$100,000

#### Computations:

 1 \$1,100,000 + \$7,000 = \$1,107,000

 2 \$710,000 + \$3,200 + \$7,300 = \$720,500

 3 \$196,000 + \$380 - \$1,500 = \$194,880

⁴\$50,000 + \$500 = \$50,500

⁵\$60,000 = \$11,000 gain + \$49,000 (decrease in investments)

 6 \$74,670 + \$10,000 - \$14,000 = \$70,670

The content of this schedule is the same as the Operating Activities section of part (1) of this solution and is not reproduced here for the sake of brevity.

## **Discussion Questions**

- 1. What is the principal disadvantage of the direct method of reporting cash flows from operating activities?
- 2. What are the major advantages of the indirect method of reporting cash flows from operating activities?
- 3. A corporation issued \$2,000,000 of common stock in exchange for \$2,000,000 of fixed assets. Where would this transaction be reported on the statement of cash flows?
- 4. A retail business, using the accrual method of accounting, owed merchandise creditors (accounts payable) \$320,000 at the beginning of the year and \$350,000 at the end of the year. How would the \$30,000 increase be used to adjust net income in determining the amount of cash flows from operating activities by the indirect method? Explain.

- 5. If salaries payable was \$100,000 at the beginning of the year and \$75,000 at the end of the year, should \$25,000 decrease be added to or deducted from income to determine the amount of cash flows from operating activities by the indirect method? Explain.
- 6. A long-term investment in bonds with a cost of \$500,000 was sold for \$600,000 cash. (a) What was the gain or loss on the sale? (b) What was the effect of the transaction on cash flows? (c) How should the transaction be reported on the statement of cash flows if cash flows from operating activities are reported by the indirect method?
- 7. A corporation issued \$2,000,000 of 20-year bonds for cash at 98. How would the transaction be reported on the statement of cash flows?

- 8. Fully depreciated equipment costing \$50,000 was discarded. What was the effect of the transaction on cash flows if (a) \$15,000 cash is received for the equipment, (b) no cash is received for the equipment?
- 9. For the current year, Packers Company decided to switch from the indirect method to the direct method for reporting cash flows from operating activities on the statement of cash flows. Will the change cause the amount of net cash flow from operating activities to be larger, smaller, or the same as if the indirect method had been used? Explain.
- 10. Name five common major classes of operating cash receipts or operating cash payments presented on the statement of cash flows when the cash flows from operating activities are reported by the direct method.

## **Practice Exercises**

#### **EE 14-1** p. 646

#### PE 14-1A Classifying cash flows

OBJ. 1

Identify whether each of the following would be reported as an operating, investing, or financing activity on the statement of cash flows:

- a. Repurchase of common stock
- d. Retirement of bonds payable
- b. Cash received from customers
- e. Purchase of equipment
- c. Payment of accounts payable
- f. Purchase of inventory for cash

#### **EE 14-1** p. 646

#### PE 14-1B Classifying cash flows

OBJ. 1

Identify whether each of the following would be reported as an operating, investing, or financing activity on the statement of cash flows:

- a. Purchase of investments
- d. Collection of accounts receivable

b. Disposal of equipment

- e. Cash sales
- c. Payment for selling expenses
- f. Issuance of bonds payable

#### **EE 14-2** p. 649

#### PE 14-2A Adjustments to net income—indirect method

OBJ. 2

Pearl Corporation's accumulated depreciation—furniture account increased by \$8,400, while \$3,080 of patent amortization was recognized between balance sheet dates. There were no purchases or sales of depreciable or intangible assets during the year. In addition, the income statement showed a loss of \$4,480 from the sale of land. Reconcile a net income of \$120,400 to net cash flow from operating activities.



ME HOW

MF HOW

#### **EE 14-2** *p. 649* **PE 1**

#### PE 14-2B Adjustments to net income—indirect method

OBJ. 2



Ya Wen Corporation's accumulated depreciation—equipment account increased by \$8,750, while \$3,250 of patent amortization was recognized between balance sheet dates. There were no purchases or sales of depreciable or intangible assets during the year. In addition, the income statement showed a gain of \$18,750 from the sale of investments. Reconcile a net income of \$175,000 to net cash flow from operating activities.

#### **EE 14-3** p. 651

#### PE 14-3A Changes in current operating assets and liabilities—indirect method

SHOW

Alpenrose Corporation's comparative balance sheet for current assets and liabilities was as follows:

	Dec. 31, 2016	Dec. 31, 2015
Accounts receivable	\$27,000	\$32,400
Inventory	18,000	15,480
Accounts payable	16,200	14,220
Dividends payable	49,500	53,100

Adjust net income of \$207,000 for changes in operating assets and liabilities to arrive at net cash flow from operating activities.

#### **EE 14-3** p. 651

#### PE 14-3B Changes in current operating assets and liabilities—indirect method OBJ. 2



Huluduey Corporation's comparative balance sheet for current assets and liabilities was as follows:

	Dec. 31, 2016	Dec. 31, 2015
Accounts receivable	\$18,000	\$14,400
Inventory	34,800	29,700
Accounts payable	27,600	20,700
Dividends pavable	8,400	10,800

Adjust net income of \$160,000 for changes in operating assets and liabilities to arrive at net cash flow from operating activities.

#### **EE 14-4** p. 652

#### PE 14-4A Cash flows from operating activities—indirect method

OBJ. 2

Pettygrove Inc. reported the following data:

SHOW ME HOW

Net income	\$405,000
Depreciation expense	45,000
Gain on disposal of equipment	36,900
Decrease in accounts receivable	25,200
Decrease in accounts payable	6,480

Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method.

#### **EE 14-4** p. 652

#### PE 14-4B Cash flows from operating activities—indirect method

OBJ. 2

Staley Inc. reported the following data:

SHOW			
ME HOW			

Net income	\$280,000
Depreciation expense	48,000
Loss on disposal of equipment	19,520
Increase in accounts receivable	17,280
Increase in accounts payable	8,960

Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method.

#### **EE 14-5** p. 655

#### PE 14-5A Land transactions on the statement of cash flows

OBJ. 2



Milo Corporation purchased land for \$540,000. Later in the year, the company sold a different piece of land with a book value of \$270,000 for \$180,000. How are the effects of these transactions reported on the statement of cash flows?

#### **EE 14-5** p. 655

#### PE 14-5B Land transactions on the statement of cash flows

OBJ. 2



IZ Corporation purchased land for \$400,000. Later in the year, the company sold a different piece of land with a book value of \$200,000 for \$240,000. How are the effects of these transactions reported on the statement of cash flows?

#### **EE 14-6** p. 657

#### PE 14-6A Cash received from customers—direct method

OBJ. 3



Sales reported on the income statement were \$480,000. The accounts receivable balance increased \$54,000 over the year. Determine the amount of cash received from customers.

## **EE 14-6** p. 657

#### PE 14-6B Cash received from customers—direct method

OBJ. 3



Sales reported on the income statement were \$112,000. The accounts receivable balance decreased \$10,500 over the year. Determine the amount of cash received from customers.

#### **EE 14-7** p. 658

#### PE 14-7A Cash payments for merchandise—direct method

OBJ. 3



The cost of merchandise sold reported on the income statement was \$770,000. The accounts payable balance decreased \$44,000, and the inventory balance decreased by \$66,000 over the year. Determine the amount of cash paid for merchandise.

#### **EE 14-7** *p. 658*

#### PE 14-7B Cash payments for merchandise—direct method

OBJ. 3



The cost of merchandise sold reported on the income statement was \$240,000. The accounts payable balance increased \$12,000, and the inventory balance increased by \$19,200 over the year. Determine the amount of cash paid for merchandise.

#### **EE 14-8** p. 662

#### PE 14-8A Free cash flow

OBJ. 4



McMahon Inc. reported the following on the company's statement of cash flows in 2016 and 2015:

	2016	2015
Net cash flow from operating activities	\$ 294,000	\$ 280,000
Net cash flow used for investing activities	(224,000)	(252,000)
Net cash flow used for financing activities	(63,000)	(42,000)

Seventy percent of the net cash flow used for investing activities was used to replace existing capacity.

- a. Determine McMahon's free cash flow for both years.
- b. Has McMahon's free cash flow improved or declined from 2015 to 2016?

#### **EE 14-8** p. 662

#### PE 14-8B Free cash flow

OBJ. 4



Dillin Inc. reported the following on the company's statement of cash flows in 2016 and 2015:

	2016	2015
Net cash flow from operating activities	\$476,000	\$455,000
Net cash flow used for investing activities	(427,000)	(378,000)
Net cash flow used for financing activities	(42,000)	(58.800)

Eighty percent of the net cash flow used for investing activities was used to replace existing capacity.

- a. Determine Dillin's free cash flow for both years.
- b. Has Dillin's free cash flow improved or declined from 2015 to 2016?

## Exercises



#### ✓ a. Cash payment, \$525,000

#### EX 14-1 Cash flows from operating activities—net loss

OBJ. 1

On its income statement for a recent year, **United Continental Holdings, Inc.**, the parent company of United Airlines, reported a net *loss* of \$723 million from operations. On its statement of cash flows, it reported \$935 million of cash flows from operating activities.

Explain this apparent contradiction between the loss and the positive cash flows.

#### EX 14-2 Effect of transactions on cash flows

OBJ. 1

State the effect (cash receipt or payment and amount) of each of the following transactions, considered individually, on cash flows:

- Retired \$500,000 of bonds, on which there was \$5,000 of unamortized discount, for \$525,000.
- b. Sold 6,000 shares of \$20 par common stock for \$30 per share.
- c. Sold equipment with a book value of \$98,200 for \$117,500.
- d. Purchased land for \$322,000 cash.
- e. Purchased a building by paying \$75,000 cash and issuing a \$62,500 mortgage note payable.
- f. Sold a new issue of \$300,000 of bonds at 101.
- g. Purchased 2,500 shares of \$40 par common stock as treasury stock at \$50 per share.
- h. Paid dividends of \$2.00 per share. There were 50,000 shares issued and 10,000 shares of treasury stock.

#### EX 14-3 Classifying cash flows

OBJ. 1

Identify the type of cash flow activity for each of the following events (operating, investing, or financing):

- a. Net income
- b. Paid cash dividends
- c. Issued common stock
- d. Issued bonds
- e. Redeemed bonds
- f. Sold long-term investments

- g. Purchased treasury stock
- h. Sold equipment
- i. Issued preferred stock
- j. Purchased buildings
- k. Purchased patents

#### EX 14-4 Cash flows from operating activities—indirect method

OBJ. 2

Indicate whether each of the following would be added to or deducted from net income in determining net cash flow from operating activities by the indirect method:

- a. Decrease in merchandise inventory
- b. Increase in accounts receivable
- c. Increase in accounts payable
- d. Loss on retirement of long-term debt
- e. Depreciation of fixed assets
- f. Decrease in notes receivable due in 60 days from customers
- g. Increase in salaries payable
- h. Decrease in prepaid expenses
- i. Amortization of patent
- j. Increase in notes payable due in 120 days to vendors
- k. Gain on disposal of fixed assets

#### **EX 14-5** Cash flows from operating activities—indirect method

**OBJ. 1, 2** 

✓ Net cash flow from operating activities, \$417,600



The net income reported on the income statement for the current year was \$400,000. Depreciation recorded on store equipment for the year amounted to \$16,000. Balances of the current asset and current liability accounts at the beginning and end of the year are as follows:

	End of Year	Beginning of Year
Cash	\$41,600	\$38,400
Accounts receivable (net)	30,400	28,000
Merchandise inventory	40,000	44,000
Prepaid expenses	4,800	3,600
Accounts payable (merchandise creditors)	40,000	36,000
Wages payable	21,200	24,000

- a. Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method.
- b. Briefly explain why net cash flow from operating activities is different than net income.

#### EX 14-6 Cash flows from operating activities—indirect method

**OBJ. 1, 2** 

The net income reported on the income statement for the current year was \$320,000. Depreciation recorded on equipment and a building amounted to \$96,000 for the year. Balances of the current asset and current liability accounts at the beginning and end of the year are as follows:

	End of Year	Beginning of Year
Cash	\$ 89,600	\$ 96,000
Accounts receivable (net)	112,000	118,400
Inventories	224,000	200,000
Prepaid expenses	12,800	14,400
Accounts payable (merchandise creditors)	96,000	104,000
Salaries payable	16,000	13,600

- a. Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method.
- b. If the direct method had been used, would the net cash flow from operating activities have been the same? Explain.

#### EX 14-7 Cash flows from operating activities—indirect method

OBJ. 1, 2

The income statement disclosed the following items for 2016:

Depreciation expense	\$ 57,600
Gain on disposal of equipment	33,600
Net income	508,000

Balances of the current assets and current liability accounts changed between December 31, 2015, and December 31, 2016, as follows:

	Increase (Decrease)
Accounts receivable	\$8,960
Inventory	(5,120)
Prepaid insurance	(1,920)
Accounts payable	(6,080)
Income taxes payable	1,410
Dividends payable	2,200

- a. Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method.
- b. Briefly explain why net cash flows from operating activities is different than net income.

✓ Net cash flow from operating activities, \$394,400



✓ Net cash flow from operating activities, \$525,410





#### EX 14-8 Determining cash payments to stockholders

OBJ. 2

The board of directors declared cash dividends totaling \$585,000 during the current year. The comparative balance sheet indicates dividends payable of \$167,625 at the beginning of the year and \$146,250 at the end of the year. What was the amount of cash payments to stockholders during the year?

#### EX 14-9 Reporting changes in equipment on statement of cash flows

OBJ. 2

An analysis of the general ledger accounts indicates that office equipment, which cost \$202,500 and on which accumulated depreciation totaled \$84,375 on the date of sale, was sold for \$101,250 during the year. Using this information, indicate the items to be reported on the statement of cash flows.

#### EX 14-10 Reporting changes in equipment on statement of cash flows

ORL

An analysis of the general ledger accounts indicates that delivery equipment, which cost \$80,000 and on which accumulated depreciation totaled \$36,000 on the date of sale, was sold for \$37,200 during the year. Using this information, indicate the items to be reported on the statement of cash flows.

#### **EX 14-11** Reporting land transactions on statement of cash flows

OBJ. 2

On the basis of the details of the following fixed asset account, indicate the items to be reported on the statement of cash flows:

ACCOUNT Land ACCOUNT NO.

					Balance	
Da	ate	ltem	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance			868,000	
Mar.	12	Purchased for cash	104,300		972,300	
Oct.	4	Sold for \$95,550		63,840	908,460	

#### EX 14-12 Reporting stockholders' equity items on statement of cash flows

**OBJ. 2** 

On the basis of the following stockholders' equity accounts, indicate the items, exclusive of net income, to be reported on the statement of cash flows. There were no unpaid dividends at either the beginning or the end of the year.

#### ACCOUNT Common Stock, \$40 par

ACCOUNT NO.

					Bala	ance
Da	ate	Item	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance, 120,000 shares				4,800,000
Apr.	2	30,000 shares issued for cash		1,200,000		6,000,000
June	30	4,400-share stock dividend		176,000		6,176,000

#### ACCOUNT Paid-In Capital in Excess of Par—Common Stock

ACCOUNT NO.

				Balance		ance
Da	ate	ltem	Debit	Credit	Debit	Credit
Jan. Apr. June	1 2 30	Balance 30,000 shares issued for cash Stock dividend		720,000 114,400		360,000 1,080,000 1,194,400

#### **ACCOUNT Retained Earnings**

#### ACCOUNT NO.

					Balance	
Da	ite	ltem	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance				2,000,000
June	30	Stock dividend	290,440			1,709,560
Dec.	30	Cash dividend	463,200			1,246,360
	31	Net income		1,440,000		2,686,360

## EX 14-13 Reporting land acquisition for cash and mortgage note on statement of cash flows

On the basis of the details of the following fixed asset account, indicate the items to be reported on the statement of cash flows:

ACCOUNT Land	ACCOUNT NO.

					Bala	nce
Da	ite	ltem	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance			156,000	
Feb.	10	Purchased for cash	246,000		402,000	
Nov.	20	Purchased with long-term				
		mortgage note	324,000		726,000	

#### EX 14-14 Reporting issuance and retirement of long-term debt

OBJ. 2

On the basis of the details of the following bonds payable and related discount accounts, indicate the items to be reported in the Financing Activities section of the statement of cash flows, assuming no gain or loss on retiring the bonds:

#### **ACCOUNT** Bonds Payable

#### ACCOUNT NO.

					Balance	
Da	ate	ltem	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance				750,000
	2	Retire bonds	150,000			600,000
June	30	Issue bonds		450,000		1,050,000

#### ACCOUNT Discount on Bonds Payable

#### ACCOUNT NO.

					Balance	
Da	ate	Item	Debit	Credit	Debit	Credit
2016						,
Jan.	1	Balance			33,750	
	2	Retire bonds		12,000	21,750	
June	30	Issue bonds	30,000		51,750	
Dec.	31	Amortize discount		2,625	49,125	

✓ Net income, \$341,770

✓ Net cash flow from operating

activities, \$42,174



#### EX 14-15 Determining net income from net cash flow from operating activities OBJ.

Curwen Inc. reported net cash flow from operating activities of \$357,500 on its statement of cash flows for the year ended December 31, 2016. The following information was reported in the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method:

Decrease in income taxes payable	\$ 7,700
Decrease in inventories	19,140
Depreciation	29,480
Gain on sale of investments	13,200
Increase in accounts payable	5,280
Increase in prepaid expenses	2,970
Increase in accounts receivable	14,300

- a. Determine the net income reported by Curwen Inc. for the year ended December 31, 2016.
- b. Briefly explain why Curwen's net income is different than net cash flow from operating activities.

#### EX 14-16 Cash flows from operating activities—indirect method

OBJ. 2

Selected data derived from the income statement and balance sheet of National Beverage Co. for a recent year are as follows:

Income statement data (in thousands):

Net earnings (loss)	\$43,993
Losses on inventory write-down and fixed assets	7
Depreciation expense	10,174
Stock-based compensation expense (noncash)	290
Balance sheet data (in thousands):	
Increase in accounts receivable	5,679
Increase in inventory	7,509
Decrease in prepaid expenses	2,239
Decrease in accounts payable and other current liabilities	1,341

- a. Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the indirect method for National Beverage Co.
- b. Interpret your results in part (a).

#### EX 14-17 Statement of cash flows—indirect method

OBJ. 2

The comparative balance sheet of Pelican Joe Industries Inc. for December 31, 2016 and 2015, is as follows:

# ✓ Net cash flow from operating activities, \$150





	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 490	\$ 160
Accounts receivable (net)	280	200
Inventories	175	110
Land	400	450
Equipment	225	175
Accumulated depreciation—equipment	(60)	(30)
Total assets	\$1,510	\$1,065
Liabilities and Stockholders' Equity		<del></del>
Accounts payable (merchandise creditors)	\$ 175	\$ 160
Dividends payable	30	_
Common stock, \$10 par	100	50
Paid-in capital: Excess of issue price over par—common stock	250	125
Retained earnings	<u>955</u>	<u>730</u>
Total liabilities and stockholders' equity	\$1,510	\$1,065

The following additional information is taken from the records:

- 1. Land was sold for \$125.
- 2. Equipment was acquired for cash.
- 3. There were no disposals of equipment during the year.
- 4. The common stock was issued for cash.
- 5. There was a \$325 credit to Retained Earnings for net income.
- 6. There was an \$100 debit to Retained Earnings for cash dividends declared.
- a. Prepare a statement of cash flows, using the indirect method of presenting cash flows from operating activities.
- b. Was Pelican Joe Industries Inc. net cash flow from operations more or less than net income? What is the source of this difference?

#### EX 14-18 Statement of cash flows—indirect method

OBJ. 2

List the errors you find in the following statement of cash flows. The cash balance at the beginning of the year was \$240,000. All other amounts are correct, except the cash balance at the end of the year.

## Shasta Inc. Statement of Cash Flows For the Year Ended December 31, 2016

Tot the real Endea December 3	, 2010		
Cash flows from operating activities:			
Net income		\$360,000	
Adjustments to reconcile net income to net			
cash flow from operating activities:			
Depreciation		100,800	
Gain on sale of investments		17,280	
Changes in current operating assets and liabilities:			
Increase in accounts receivable		27,360	
Increase in inventories		(36,000)	
Increase in accounts payable		(3,600)	
Decrease in accrued expenses payable		(2,400)	
Net cash flow from operating activities			\$ 463,440
Cash flows from investing activities:			
Cash received from sale of investments		\$240,000	
Less: Cash paid for purchase of land	\$259,200		
Cash paid for purchase of equipment	432,000	691,200	
Net cash flow used for investing activities			(415,200)
Cash flows from financing activities:			
Cash received from sale of common stock		\$312,000	
Cash paid for dividends		132,000	
Net cash flow from financing activities			180,000
Increase in cash			\$ 47,760
Cash at the end of the year			192,240
Cash at the beginning of the year			\$240,000
J ,			

#### EX 14-19 Cash flows from operating activities—direct method

OBJ. 3

✓ a. \$801,900

The cash flows from operating activities are reported by the direct method on the statement of cash flows. Determine the following:

- a. If sales for the current year were \$753,500 and accounts receivable decreased by \$48,400 during the year, what was the amount of cash received from customers?
- b. If income tax expense for the current year was \$50,600 and income tax payable decreased by \$5,500 during the year, what was the amount of cash payments for income taxes?
- c. Briefly explain why the cash received from customers in (a) is different than sales.



#### EX 14-20 Cash paid for merchandise purchases

OBJ. 3

The cost of merchandise sold for Kohl's Corporation for a recent year was \$11,625 million. The balance sheet showed the following current account balances (in millions):

	Balance, End of Year	Balance, Beginning of Year
Merchandise inventories	\$3,199	\$3,036
Accounts payable	1,233	1,138

Determine the amount of cash payments for merchandise.

## **EX 14-21** Determining selected amounts for cash flows from operating activities—direct method

OBJ. 3

✓ a. \$1,025,800

Selected data taken from the accounting records of Ginis Inc. for the current year ended December 31 are as follows:

	Balance, December 31	Balance, January 1
Accrued expenses payable (operating expenses)	\$ 12,650	\$ 14,030
Accounts payable (merchandise creditors)	96,140	105,800
Inventories	178,020	193,430
Prepaid expenses	7,360	8,970

During the current year, the cost of merchandise sold was \$1,031,550, and the operating expenses other than depreciation were \$179,400. The direct method is used for presenting the cash flows from operating activities on the statement of cash flows.

Determine the amount reported on the statement of cash flows for (a) cash payments for merchandise and (b) cash payments for operating expenses.

#### EX 14-22 Cash flows from operating activities—direct method

OBJ. 3

The income statement of Booker T Industries Inc. for the current year ended June 30 is as follows:

Sales		\$511,000
Cost of merchandise sold		290,500
Gross profit		\$220,500
Operating expenses:		
Depreciation expense	\$ 39,200	
Other operating expenses	105,000	
Total operating expenses		144,200
Income before income tax		\$ 76,300
Income tax expense		21,700
Net income		\$ 54,600

Changes in the balances of selected accounts from the beginning to the end of the current year are as follows:

	Increase (Decrease)
Accounts receivable (net)	(\$11,760)
Inventories	3,920
Prepaid expenses	(3,780)
Accounts payable (merchandise creditors)	(7,980)
Accrued expenses payable (operating expenses)	1,260
Income tax payable	(2,660)

- a. Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the direct method.
- b. What does the direct method show about a company's cash flows from operating activities that is not shown using the indirect method?

✓ Net cash flow from operating activities, \$96,040

#### EX 14-23 Cash flows from operating activities—direct method

OBJ. 3

✓ Net cash flow from operating activities, \$123,860

The income statement for Rhino Company for the current year ended June 30 and balances of selected accounts at the beginning and the end of the year are as follows:

Sales		\$445,500
Cost of merchandise sold		154,000
Gross profit		\$291,500
Operating expenses:		
Depreciation expense	\$ 38,500	
Other operating expenses	115,280	
Total operating expenses		153,780
Income before income tax		\$137,720
Income tax expense		39,600
Net income		\$ 98,120

	End of Year	Beginning of Year
Accounts receivable (net)	\$36,300	\$31,240
Inventories	92,400	80,300
Prepaid expenses	14,520	15,840
Accounts payable (merchandise creditors)	67,540	62,700
Accrued expenses payable (operating expenses)	19,140	20,900
Income tax payable	4,400	4,400

Prepare the Cash Flows from Operating Activities section of the statement of cash flows, using the direct method.

#### EX 14-24 Free cash flow

**OBJ. 4** 

Sweeter Enterprises Inc. has cash flows from operating activities of \$539,000. Cash flows used for investments in property, plant, and equipment totaled \$210,000, of which 75% of this investment was used to replace existing capacity.

- a. Determine the free cash flow for Sweeter Enterprises Inc.
- How might a lender use free cash flow to determine whether or not to give Sweeter Enterprises Inc. a loan?

#### EX 14-25 Free cash flow

**OBJ. 4** 





The financial statements for Nike, Inc., are provided in Appendix B at the end of the text.

- a. Determine the free cash flow for the most recent fiscal year. Assume that 90% of the additions to property, plant, and equipment were used to maintain productive capacity. Round to the nearest thousand dollars.
- b. How might a lender use free cash flow to determine whether or not to give Nike, Inc., a loan?
- c. Would you feel comfortable giving Nike a loan, based on the free cash flow calculated in (a)?

#### EX 14-26 Free cash flow

**OBJ. 4** 

Lovato Motors Inc. has cash flows from operating activities of \$720,000. Cash flows used for investments in property, plant, and equipment totaled \$440,000, of which 85% of this investment was used to replace existing capacity.

Determine the free cash flow for Lovato Motors Inc.



## **Problems: Series A**

#### PR 14-1A Statement of cash flows—indirect method

OBJ. 2

✓ Net cash flow from operating activities, \$143,540





The comparative balance sheet of Cromme Inc. for December 31, 2016 and 2015, is shown as follows:

	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 625,760	\$ 585,920
Accounts receivable (net)	227,840	208,960
Inventories	641,760	617,120
Investments	0	240,000
Land	328,000	0
Equipment	705,120	553,120
Accumulated depreciation—equipment	(166,400)	(148,000)
Total assets	\$2,362,080	\$2,057,120
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 424,480	\$ 404,960
Accrued expenses payable (operating expenses)	42,240	52,640
Dividends payable	24,000	19,200
Common stock, \$4 par	150,000	100,000
Paid-in capital: Excess of issue price over par—common stock	417,500	280,000
Retained earnings	1,303,860	1,200,320
Total liabilities and stockholders' equity	\$2,362,080	\$2,057,120

Additional data obtained from an examination of the accounts in the ledger for 2016 are as follows:

- a. The investments were sold for \$280,000 cash.
- b. Equipment and land were acquired for cash.
- c. There were no disposals of equipment during the year.
- d. The common stock was issued for cash.
- e. There was a \$199,540 credit to Retained Earnings for net income.
- f. There was a \$96,000 debit to Retained Earnings for cash dividends declared.

#### Instructions

Prepare a statement of cash flows, using the indirect method of presenting cash flows from operating activities.

#### PR 14-2A Statement of cash flows—indirect method

OBJ. 2

The comparative balance sheet of Del Ray Enterprises Inc. at December 31, 2016 and 2015, is as follows:

	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 146,600	\$ 179,800
Accounts receivable (net)	224,600	242,000
Merchandise inventory	321,600	299,200
Prepaid expenses	13,400	9,600
Equipment	655,000	537,000
Accumulated depreciation—equipment	(170,800)	(132,200)
Total assets	\$1,190,400	\$1,135,400
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 250,200	\$ 237,600
Mortgage note payable	0	336,000
Common stock, \$10 par	74,000	24,000
Paid-in capital: Excess of issue price over par—common stock	470,000	320,000
Retained earnings	396,200	217,800
Total liabilities and stockholders' equity	\$1,190,400	\$1,135,400

✓ Net cash flow from operating activities, \$419,200





Additional data obtained from the income statement and from an examination of the accounts in the ledger for 2016 are as follows:

- a. Net income, \$332,000
- b. Depreciation reported on the income statement, \$83,400
- c. Equipment was purchased at a cost of \$162,800 and fully depreciated equipment costing \$44,800 was discarded, with no salvage realized.
- d. The mortgage note payable was not due until 2018 but the terms permitted earlier payment without penalty.
- e. 10,000 shares of common stock were issued at \$20 for cash.
- f. Cash dividends declared and paid, \$153,600

#### **Instructions**

Prepare a statement of cash flows, using the indirect method of presenting cash flows from operating activities.

#### PR 14-3A Statement of cash flows—indirect method

OBJ. 2

The comparative balance sheet of Whitman Co. at December 31, 2016 and 2015, is as follows:

✓ Net cash flow from operating activities, \$(169,600)



	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 918,000	\$ 964,800
Accounts receivable (net)	828,900	761,940
Inventories	1,268,460	1,162,980
Prepaid expenses	29,340	35,100
Land	315,900	479,700
Buildings	1,462,500	900,900
Accumulated depreciation—buildings	(408,600)	(382,320)
Equipment	512,280	454,680
Accumulated depreciation—equipment	(141,300)	(158,760)
Total assets	\$4,785,480	\$4,219,020
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 922,500	\$ 958,320
Bonds payable	270,000	0
Common stock, \$25 par	317,000	117,000
Paid-in capital: Excess of issue price over par—common stock	758,000	558,000
Retained earnings	2,517,980	2,585,700
Total liabilities and stockholders' equity	\$4,785,480	\$4,219,020

The noncurrent asset, noncurrent liability, and stockholders' equity accounts for 2016 are as follows:

ACCOUNT Land ACCOUNT NO.

					Balance	
Da	ate	ltem	Debit	Credit	Debit	Credit
Jan. Apr.	1 20	Balance Realized \$151,200 cash from sale		163,800	479,700 315,900	

#### **ACCOUNT Buildings**

ACCOUNT NO.

					Balance	
Da	te	ltem	Debit	Credit	Debit	Credit
²⁰¹⁶ Jan.	1	Balance			900,900	
Apr.	20	Acquired for cash	561,600		1,462,500	

(Continued)

#### ACCOUNT Accumulated Depreciation—Buildings

	ACCOUNT NO.				
	Bala	nce			
lit	Debit	Credit			

					Balance	
Da	ite	Item	Debit	Credit	Debit	Credit
²⁰¹⁶ Jan.	1	Balance				382,320
Dec.	31	Depreciation for year		26,280		408,600

#### **ACCOUNT Equipment**

#### ACCOUNT NO.

					Balance	
Da	ite	Item	Debit	Credit	Debit	Credit
²⁰¹⁶ Jan.	1 26	Balance Discarded, no salvage		46,800	454,680 407,880	
Aug.	11	Purchased for cash	104,400		512,280	

#### ACCOUNT Accumulated Depreciation—Equipment

#### ACCOUNT NO.

					Balance	
Da	ate	ltem	Debit	Credit	Debit	Credit
Jan. Dec.	1 26 31	Balance Equipment discarded Depreciation for year	46,800	29,340		158,760 111,960 141,300

#### **ACCOUNT Bonds Payable**

#### ACCOUNT NO.

					Bala	ance
Da	ate	ltem	Debit	Credit	Debit	Credit
²⁰¹⁶ May	1	Issued 20-year bonds		270,000		270,000

#### ACCOUNT Common Stock, \$25 par

#### ACCOUNT NO.

					Balance	
Da	ate	ltem	Debit	Credit	Debit	Credit
Jan. Dec.	1 7	Balance Issued 8,000 shares of common				117,000
		stock for \$50 per share		200,000		317,000

#### ACCOUNT Paid-In Capital in Excess of Par—Common Stock

#### ACCOUNT NO.

					Balan	
Da	ate	ltem	Debit	Credit	Debit	Credit
Jan.	1	Balance				558,000
Dec.	/	Issued 8,000 shares of common stock for \$50 per share		200,000		758,000

#### **ACCOUNT Retained Earnings**

#### ACCOUNT NO.

					Balance	
Da	ate	ltem	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance				2,585,700
Dec.	31	Net loss	35,320			2,550,380
	31	Cash dividends	32,400			2,517,980

#### **Instructions**

Prepare a statement of cash flows, using the indirect method of presenting cash flows from operating activities.

#### PR 14-4A Statement of cash flows—direct method

OBJ. 3

The comparative balance sheet of Canace Products Inc. for December 31, 2016 and 2015, is as follows:

✓ Net cash flow from operating activities, \$293,600







	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 643,400	\$ 679,400
Accounts receivable (net)	566,800	547,400
Inventories	1,011,000	982,800
Investments	0	240,000
Land	520,000	0
Equipment	880,000	680,000
Accumulated depreciation	(244,400)	(200,400)
Total assets	\$3,376,800	\$2,929,200
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 771,800	\$ 748,400
Accrued expenses payable (operating expenses)	63,400	70,800
Dividends payable	8,800	6,400
Common stock, \$2 par	56,000	32,000
Paid-in capital: Excess of issue price over par—common stock	408,000	192,000
Retained earnings	2,068,800	1,879,600
Total liabilities and stockholders' equity	\$3,376,800	\$2,929,200

The income statement for the year ended December 31, 2016, is as follows:

Sales		\$5,980,000
Gross profit		<u>2,452,000</u> \$3,528,000
Operating expenses:		
Depreciation expense	\$ 44,000	
Other operating expenses	3,100,000	
Total operating expenses		3,144,000
Operating income		\$ 384,000
Other expense:		
Loss on sale of investments		(64,000)
Income before income tax		\$ 320,000
Income tax expense		102,800
Net income		\$ 217,200

Additional data obtained from an examination of the accounts in the ledger for 2016 are as follows:

- a. Equipment and land were acquired for cash.
- b. There were no disposals of equipment during the year.

(Continued)

- c. The investments were sold for \$176,000 cash.
- d. The common stock was issued for cash.
- e. There was a \$28,000 debit to Retained Earnings for cash dividends declared.

#### **Instructions**

Prepare a statement of cash flows, using the direct method of presenting cash flows from operating activities.

#### PR 14-5A Statement of cash flows—direct method applied to PR 14-1A

OBJ. 3

The comparative balance sheet of Cromme Inc. for December 31, 2016 and 2015, is as follows:

✓ Net cash flow from operating activities, \$143,540



	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 625,760	\$ 585,920
Accounts receivable (net)	227,840	208,960
Inventories	641,760	617,120
Investments	0	240,000
Land	328,000	0
Equipment	705,120	553,120
Accumulated depreciation—equipment	(166,400)	(148,000)
Total assets	\$2,362,080	\$2,057,120
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 424,480	\$ 404,960
Accrued expenses payable (operating expenses)	42,240	52,640
Dividends payable	24,000	19,200
Common stock, \$2 par	150,000	100,000
Paid-in capital: Excess of issue price over par—common stock	417,500	280,000
Retained earnings	1,303,860	1,200,320
Total liabilities and stockholders' equity	\$2,362,080	\$2,057,120
The income statement for the year ended December 3	1, 2016, is as fo	ollows:

Sales		\$5,372,559
Cost of merchandise sold		3,306,190
Gross profit		\$2,066,369
Operating expenses:		
Depreciation expense	\$ 18,400	
Other operating expenses	1,755,402	
Total operating expenses		1,773,802
Operating income		\$ 292,567
Other income:		
Gain on sale of investments		40,000
Income before income tax		\$ 332,567
Income tax expense		133,027
Net income		\$ 199,540

Additional data obtained from an examination of the accounts in the ledger for 2016 are as follows:

- a. The investments were sold for \$280,000 cash.
- b. Equipment and land were acquired for cash.
- c. There were no disposals of equipment during the year.
- d. The common stock was issued for cash.
- e. There was a \$96,000 debit to Retained Earnings for cash dividends declared.

#### **Instructions**

Prepare a statement of cash flows, using the direct method of presenting cash flows from operating activities.

# **Problems: Series B**

# ✓ Net cash flow from operating activities,



\$154,260



#### PR 14-1B Statement of cash flows—indirect method

OBJ. 2

The comparative balance sheet of Merrick Equipment Co. for December 31, 2016 and 2015, is as follows:

	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 70,720	\$ 47,940
Accounts receivable (net)	207,230	188,190
Inventories	298,520	289,850
Investments	0	102,000
Land	295,800	0
Equipment	438,600	358,020
Accumulated depreciation—equipment	(99,110)	(84,320)
Total assets	\$1,211,760	\$901,680
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 205,700	\$194,140
Accrued expenses payable (operating expenses)	30,600	26,860
Dividends payable	25,500	20,400
Common stock, \$1 par	202,000	102,000
Paid-in capital: Excess of issue price over par—common stock	354,000	204,000
Retained earnings	393,960	354,280
Total liabilities and stockholders' equity	\$1,211,760	\$901,680

Additional data obtained from an examination of the accounts in the ledger for 2016 are as follows:

- a. Equipment and land were acquired for cash.
- b. There were no disposals of equipment during the year.
- c. The investments were sold for \$91,800 cash.
- d. The common stock was issued for cash.
- e. There was a \$141,680 credit to Retained Earnings for net income.
- f. There was a \$102,000 debit to Retained Earnings for cash dividends declared.

#### Instructions

Prepare a statement of cash flows, using the indirect method of presenting cash flows from operating activities.

#### PR 14-2B Statement of cash flows—indirect method

OBJ. 2

The comparative balance sheet of Harris Industries Inc. at December 31, 2016 and 2015, is as follows:

	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 443,240	\$ 360,920
Accounts receivable (net)	665,280	592,200
Inventories	887,880	1,022,560
Prepaid expenses	31,640	25,200
Land	302,400	302,400
Buildings	1,713,600	1,134,000
Accumulated depreciation—buildings	(466,200)	(414,540)
Machinery and equipment	781,200	781,200
Accumulated depreciation—machinery and equipment	(214,200)	(191,520)
Patents	106,960	112,000
Total assets	\$4,251,800	\$3,724,420

(Continued)

✓ Net cash flow from operating activities, \$561,400





#### Liabilities and Stockholders' Equity

Accounts payable (merchandise creditors)	\$ 837,480	\$ 927,080
Dividends payable	32,760	25,200
Salaries payable	78,960	87,080
Mortgage note payable, due 2017	224,000	0
Bonds payable	0	390,000
Common stock, \$5 par	200,400	50,400
Paid-in capital: Excess of issue price over par—common stock	366,000	126,000
Retained earnings	2,512,200	2,118,660
Total liabilities and stockholders' equity	\$4,251,800	\$3,724,420

An examination of the income statement and the accounting records revealed the following additional information applicable to 2016:

- a. Net income, \$524,580.
- b. Depreciation expense reported on the income statement: buildings, \$51,660; machinery and equipment, \$22,680.
- c. Patent amortization reported on the income statement, \$5,040.
- d. A building was constructed for \$579,600.
- e. A mortgage note for \$224,000 was issued for cash.
- f. 30,000 shares of common stock were issued at \$13 in exchange for the bonds payable.
- g. Cash dividends declared, \$131,040.

#### **Instructions**

Prepare a statement of cash flows, using the indirect method of presenting cash flows from operating activities.

#### PR 14-3B Statement of cash flows—indirect method

OBJ. 2

The comparative balance sheet of Coulson, Inc. at December 31, 2016 and 2015, is as follows:

${\sf Cash}\ .$
Accour
Invento
Prepaid
$Land\ .$
Buildin

✓ Net cash flow from operating activities,

\$162,800

	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 300,600	\$ 337,800
Accounts receivable (net)	704,400	609,600
Inventories	918,600	865,800
Prepaid expenses	18,600	26,400
Land	990,000	1,386,000
Buildings	1,980,000	990,000
Accumulated depreciation—buildings	(397,200)	(366,000)
Equipment	660,600	529,800
Accumulated depreciation—equipment	(133,200)	(162,000)
Total assets	\$5,042,400	\$4,217,400
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 594,000	\$ 631,200
Income taxes payable	26,400	21,600
Bonds payable	330,000	0
Common stock, \$20 par	320,000	180,000
Paid-in capital: Excess of issue price over par—common stock	950,000	810,000
Retained earnings	2,822,000	2,574,600
Total liabilities and stockholders' equity	\$5,042,400	\$4,217,400

The noncurrent asset, noncurrent liability, and stockholders' equity accounts for 2016 are as follows:

#### **ACCOUNT Land**

## ACCOUNT NO.

					Balance	
Da	ite	ltem	Debit	Credit	Debit	Credit
²⁰¹⁶ Jan. Apr.	1 20	Balance Realized \$456,000 cash			1,386,000	
		from sale		396,000	990,000	

#### **ACCOUNT Buildings**

#### ACCOUNT NO.

					Balance	
Da	ate	Item	Debit	Credit	Debit	Credit
Jan. Apr.	1 20	Balance Acquired for cash	990,000		990,000 1,980,000	

#### ACCOUNT Accumulated Depreciation—Buildings

#### ACCOUNT NO.

					Balance	
Da	ite	ltem	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance				366,000
Dec.	31	Depreciation for year		31,200		397,200

#### ACCOUNT Equipment

#### ACCOUNT NO.

					Balance	
Da	ate	Item	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance			529,800	
	26	Discarded, no salvage		66,000	463,800	
Aug.	11	Purchased for cash	196,800		660,600	

### ACCOUNT Accumulated Depreciation—Equipment

### ACCOUNT NO.

					Balance	
Da	ate	Item	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance				162,000
	26	Equipment discarded	66,000			96,000
Dec.	31	Depreciation for year		37,200		133,200

## ACCOUNT Bonds Payable

## ACCOUNT NO.

					Bala	ance	
Da	ite	ltem	Debit	Credit	Debit	Credit	
²⁰¹⁶ May	1	Issued 20-year bonds		330,000		330,000	

(Continued)

#### ACCOUNT Common Stock, \$20 par

#### ACCOUNT NO.

					Bala	ance
Da	ate	ltem	Debit	Credit	Debit	Credit
Jan. Dec.	1 7	Balance Issued 7,000 shares of common				180,000
		stock for \$40 per share		140,000		320,000

### ACCOUNT Paid-In Capital in Excess of Par—Common Stock

#### ACCOUNT NO.

					Balance	
Da	ate	Item	Debit	Credit	Debit	Credit
Jan. Dec.	1 7	Balance Issued 7,000 shares of common stock for \$40 per share		140,000		810,000 950,000

#### **ACCOUNT Retained Earnings**

#### ACCOUNT NO.

					Balance	
Da	ate	ltem	Debit	Credit	Debit	Credit
2016						
Jan.	1	Balance				2,574,600
Dec.	31	Net income		326,600		2,901,200
	31	Cash dividends	79,200			2,822,000

### **Instructions**

Prepare a statement of cash flows, using the indirect method of presenting cash flows from operating activities.

#### PR 14-4B Statement of cash flows—direct method

OBJ. 3

The comparative balance sheet of Martinez Inc. for December 31, 2016 and 2015, is as follows:

✓ Net cash flow from operating activities, \$509,220



General Ledger



	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 661,920	\$ 683,100
Accounts receivable (net)	992,640	914,400
Inventories	1,394,400	1,363,800
Investments	0	432,000
Land	960,000	0
Equipment	1,224,000	984,000
Accumulated depreciation—equipment	(481,500)	(368,400)
Total assets	\$4,751,460	\$4,008,900
Liabilities and Stockholders' Equity		<del></del>
Accounts payable (merchandise creditors)	\$1,080,000	\$ 966,600
Accrued expenses payable (operating expenses)	67,800	79,200
Dividends payable	100,800	91,200
Common stock, \$5 par	130,000	30,000
Paid-in capital: Excess of issue price over par—common stock	950,000	450,000
Retained earnings	2,422,860	2,391,900
Total liabilities and stockholders' equity	\$4,751,460	\$4,008,900

The income statement for the year ended December 31, 2016, is as follows:

Sales		\$4,512,000 <u>2,352,000</u> \$2,160,000
Operating expenses:		
Depreciation expense	\$ 113,100	
Other operating expenses	1,344,840	
Total operating expenses		1,457,940
Operating income		\$ 702,060
Other income:		
Gain on sale of investments		156,000
Income before income tax		\$ 858,060
Income tax expense		299,100
Net income		\$ 558,960

Additional data obtained from an examination of the accounts in the ledger for 2016 are as follows:

- a. Equipment and land were acquired for cash.
- b. There were no disposals of equipment during the year.
- c. The investments were sold for \$588,000 cash.
- d. The common stock was issued for cash.
- e. There was a \$528,000 debit to Retained Earnings for cash dividends declared.

#### **Instructions**

Prepare a statement of cash flows, using the direct method of presenting cash flows from operating activities.

PR 14-5B Statement of cash flows—direct method applied to PR 14-1B

OBJ. 3

The comparative balance sheet of Merrick Equipment Co. for Dec. 31, 2016 and 2015, is:

\$154,2	260
X	7

✓ Net cash flow from operating activities,

	Dec. 31, 2016	Dec. 31, 2015
Assets		
Cash	\$ 70,720	\$ 47,940
Accounts receivable (net)	207,230	188,190
Inventories	298,520	289,850
Investments	0	102,000
Land	295,800	0
Equipment	438,600	358,020
Accumulated depreciation—equipment	(99,110)	(84,320)
Total assets	\$1,211,760	\$ 901,680
Liabilities and Stockholders' Equity		
Accounts payable (merchandise creditors)	\$ 205,700	\$ 194,140
Accrued expenses payable (operating expenses)	30,600	26,860
Dividends payable	25,500	20,400
Common stock, \$1 par	202,000	102,000
Paid-in capital: Excess of issue price over par—common stock	354,000	204,000
Retained earnings	393,960	354,280
Total liabilities and stockholders' equity	\$1,211,760	\$ 901,680

(Continued)

The income statement for the year ended December 31, 2016, is as follows:

Sales		\$2,023,898
Cost of merchandise sold		1,245,476
Gross profit		\$ 778,422
Operating expenses:		
Depreciation expense	\$ 14,790	
Other operating expenses	517,299	
Total operating expenses		532,089
Operating income		\$ 246,333
Other expenses:		
Loss on sale of investments		(10,200)
Income before income tax		\$ 236,133
Income tax expense		94,453
Net income		\$ 141,680

Additional data obtained from an examination of the accounts in the ledger for 2016 are as follows:

- a. Equipment and land were acquired for cash.
- b. There were no disposals of equipment during the year.
- c. The investments were sold for \$91,800 cash.
- d. The common stock was issued for cash.
- e. There was a \$102,000 debit to Retained Earnings for cash dividends declared.

#### **Instructions**

Prepare a statement of cash flows, using the direct method of presenting cash flows from operating activities.

# **Cases & Projects**



#### CP 14-1 Ethics and professional conduct in business

Lucas Hunter, president of Simmons Industries Inc., believes that reporting operating cash flow per share on the income statement would be a useful addition to the company's just completed financial statements. The following discussion took place between Lucas Hunter and Simmons' controller, John Jameson, in January, after the close of the fiscal year:

Lucas: I've been reviewing our financial statements for the last year. I am disappointed that our net income per share has dropped by 10% from last year. This won't look good to our shareholders. Is there anything we can do about this?

John: What do you mean? The past is the past, and the numbers are in. There isn't much that can be done about it. Our financial statements were prepared according to generally accepted accounting principles, and I don't see much leeway for significant change at this point.

Lucas: No, no. I'm not suggesting that we "cook the books." But look at the cash flow from operating activities on the statement of cash flows. The cash flow from operating activities has increased by 20%. This is very good news—and, I might add, useful information. The higher cash flow from operating activities will give our creditors comfort.

John: Well, the cash flow from operating activities is on the statement of cash flows, so I guess users will be able to see the improved cash flow figures there.

Lucas: This is true, but somehow I feel that this information should be given a much higher profile. I don't like this information being "buried" in the statement of cash flows. You know as well as I do that many users will focus on the income statement. Therefore, I think we ought to include an operating cash flow per share number on the face of the income statement—someplace under the earnings per share number. In this way, users will get the complete picture of our operating performance. Yes, our earnings per share dropped this year, but our cash flow from operating activities improved! And all the information is in one place where users can see and compare the figures. What do you think?

(Continued)

John: I've never really thought about it like that before. I guess we could put the operating cash flow per share on the income statement, under the earnings per share. Users would really benefit from this disclosure. Thanks for the idea—I'll start working on it.

Lucas: Glad to be of service.

How would you interpret this situation? Is John behaving in an ethical and professional manner?

#### CP 14-2 Using the statement of cash flows

You are considering an investment in a new start-up company, Giraffe Inc., an Internet service provider. A review of the company's financial statements reveals a negative retained earnings. In addition, it appears as though the company has been running a negative cash flow from operating activities since the company's inception.

How is the company staying in business under these circumstances? Could this be a good investment?

#### CP 14-3 Analysis of statement of cash flows

Dillip Lachgar is the president and majority shareholder of Argon Inc., a small retail store chain. Recently, Dillip submitted a loan application for Argon Inc. to Compound Bank. It called for a \$600,000, 9%, 10-year loan to help finance the construction of a building and the purchase of store equipment, costing a total of \$750,000. This will enable Argon Inc. to open a store in the town of Compound. Land for this purpose was acquired last year. The bank's loan officer requested a statement of cash flows in addition to the most recent income statement, balance sheet, and retained earnings statement that Dillip had submitted with the loan application.

As a close family friend, Dillip asked you to prepare a statement of cash flows. From the records provided, you prepared the following statement:

# Argon Inc. Statement of Cash Flows For the Year Ended December 31, 2016

For the Year Ended December 31, 2016		
Cash flows from operating activities:		
Net income	\$ 300,000	
Adjustments to reconcile net income to net cash flow from operating activities:		
Depreciation	84,000	
Gain on sale of investments	(30,000)	
Changes in current operating assets and liabilities:		
Decrease in accounts receivable	21,000	
Increase in inventories	(42,000)	
Increase in accounts payable	30,000	
Decrease in accrued expenses payable	(6,000)	
Net cash flow from operating activities		\$ 357,000
Cash flows from investing activities:		
Cash received from investments sold	\$ 180,000	
Less: Cash paid for purchase of store equipment	(120,000)	
Net cash flow from investing activities		60,000
Cash flows from financing activities:		
Cash paid for dividends	\$ (126,000)	
Net cash flow used for financing activities		(126,000)
Increase in cash		\$ 291,000
Cash at the beginning of the year		108,000
Cash at the end of the year		\$ 399,000
Schedule of Noncash Financing and Investing Activities:		
Issued common stock for land		\$ 240,000

After reviewing the statement, Dillip telephoned you and commented, "Are you sure this statement is right?" Dillip then raised the following questions:

- 1. "How can depreciation be a cash flow?"
- 2. "Issuing common stock for the land is listed in a separate schedule. This transaction has nothing to do with cash! Shouldn't this transaction be eliminated from the statement?"
- 3. "How can the gain on the sale of investments be a deduction from net income in determining the cash flow from operating activities?"
- 4. "Why does the bank need this statement anyway? They can compute the increase in cash from the balance sheets for the last two years."

After jotting down Dillip's questions, you assured him that this statement was "right." But to alleviate Dillip's concern, you arranged a meeting for the following day.

- How would you respond to each of Dillip's questions?
- b. Do you think that the statement of cash flows enhances the chances of Argon Inc. receiving the loan? Discuss.

#### CP 14-4 Analysis of cash flow from operations

The Commercial Division of Tidewater Inc. provided the following information on its cash flow from operations:

Net income	\$ 945,000
Increase in accounts receivable	(1,134,000)
Increase in inventory	(1,260,000)
Decrease in accounts payable	(189,000)
Depreciation	210,000
Cash flow from operating activities	\$(1,428,000)

The manager of the Commercial Division provided the accompanying memo with this report:

From: Senior Vice President, Commercial Division

I am pleased to report that we had earnings of \$945,000 over the last period. This resulted in a return on invested capital of 8%, which is near our targets for this division. I have been aggressive in building the revenue volume in the division. As a result, I am happy to report that we have increased the number of new credit card customers as a result of an aggressive marketing campaign. In addition, we have found some excellent merchandise opportunities. Some of our suppliers have made some of their apparel merchandise available at a deep discount. We have purchased as much of these goods as possible in order to improve profitability. I'm also happy to report that our vendor payment problems have improved. We are nearly caught up on our overdue payables balances.

Comment on the senior vice president's memo in light of the cash flow information.

### CP 14-5 Statement of cash flows





**Internet Project** 

#### **Group Project**

This activity will require two teams to retrieve cash flow statement information from the Internet. One team is to obtain the most recent year's statement of cash flows for Johnson & Johnson, and the other team the most recent year's statement of cash flows for JetBlue Airways Corp.

The statement of cash flows is included as part of the annual report information that is a required disclosure to the Securities and Exchange Commission (SEC). SEC documents can be retrieved using the EdgarScan™ service at www.sec.gov/edgar/searchedgar/ companysearch.html.

To obtain annual report information, key in a company name in the appropriate space. EdgarScan will list the reports available to you for the company you've selected. Select the most recent annual report filing, identified as a 10-K or 10-K405. EdgarScan provides an outline of the report, including the separate financial statements. You can double-click the income statement and balance sheet for the selected company into an Excel $^{\text{TM}}$  spreadsheet for further analysis.

As a group, compare the two statements of cash flows.

- a. How are Johnson & Johnson and JetBlue Airways Corp. similar or different regarding cash flows?
- b. Compute and compare the free cash flow for each company, assuming additions to property, plant, and equipment replace current capacity.



# Financial Statement Analysis

# Nike, Inc.

Just do it." These three words identify one of the most recognizable brands in the world, **Nike**. While this phrase inspires athletes to "compete and achieve their potential," it also defines the company.

Nike began in 1964 as a partnership between University of Oregon track coach Bill Bowerman and one of his former student-athletes, Phil Knight. The two began by selling shoes imported from Japan out of the back of Knight's car to athletes at track and field events. As sales grew, the company opened retail outlets, calling itself **Blue Ribbon Sports**. The company also began to develop its own shoes. In 1971, the company commissioned a graphic design student at Portland State University to develop the swoosh logo for a fee of \$35. In 1978, the company changed its name to Nike, and in 1980, it sold its first shares of stock to the public.

Nike would have been a great company to invest in at the time. If you had invested in Nike's common stock back in 1990,

you would have paid \$5.00 per share. As of April 2011, Nike's stock was worth \$109.23 per share. Unfortunately, you can't invest using hindsight.

How can you select companies in which to invest? Like any significant purchase, you should do some research to guide your investment decision. If you were buying a car, for example, you might go to **Edmunds.com** to obtain reviews, ratings, prices, specifications, options, and fuel economies to evaluate different vehicles. In selecting companies to invest in, you can use financial analysis to gain insight into a company's past performance and future prospects. This chapter describes and illustrates common financial data that can be analyzed to assist you in making investment decisions such as whether or not to invest in Nike's stock.

Source: www.nikebiz.com/.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe basic financial statement analytical methods. Basic Analytical Methods Horizontal Analysis Vertical Analysis Common-Sized Statements Other Analytical Measures	EE 15-1 EE 15-2
Use financial statement analysis to assess the solvency of a business. Liquidity and Solvency Analysis Current Position Analysis Accounts Receivable Analysis Inventory Analysis Ratio of Fixed Assets to Long-Term Liabilities Ratio of Liabilities to Stockholders' Equity Number of Times Interest Charges Are Earned	EE 15-3 EE 15-4 EE 15-5 EE 15-6 EE 15-7
Use financial statement analysis to assess the profitability of a business.  Profitability Analysis  Ratio of Sales to Assets  Rate Earned on Total Assets  Rate Earned on Stockholders' Equity  Rate Earned on Common Stockholders' Equity  Earnings per Share on Common Stock  Price-Earnings Ratio  Divdends per Share  Divdend Yield  Summary of Analytical Measures	EE 15-8 EE 15-9 EE 15-10 EE 15-11
Describe the contents of corporate annual reports. Corporate Annual Reports  Management Discussion and Analysis Report on Internal Control Report on Fairness of the Financial Statements	At a Glance 15 Page 723

Describe basic financial statement analytical methods.

# **Basic Analytical Methods**

Users analyze a company's financial statements using a variety of analytical methods. Three such methods are:

- Horizontal analysis
- Vertical analysis
- Common-sized statements

# **Horizontal Analysis**

The analysis of increases and decreases in the amount and percentage of comparative financial statement items is called **horizontal analysis**. Each item on the most recent statement is compared with the same item on one or more earlier statements in terms of the following:

- Amount of increase or decrease
- Percent of increase or decrease

When comparing statements, the earlier statement is normally used as the base year for computing increases and decreases.

Exhibit 1 illustrates horizontal analysis for the December 31, 2016 and 2015, balance sheets of **Lincoln Company**. In Exhibit 1, the December 31, 2015, balance sheet (the earliest year presented) is used as the base year.

Exhibit 1 indicates that total assets decreased by \$91,000 (7.4%), liabilities decreased by \$133,000 (30.0%), and stockholders' equity increased by \$42,000 (5.3%). Since the long-term investments account decreased by \$82,500, it appears that most of the decrease in long-term liabilities of \$100,000 was achieved through the sale of long-term investments.

#### Lincoln Company **Comparative Balance Sheet** December 31, 2016 and 2015 Dec. 31, Dec. 31, Increase (Decrease) 2016 2015 Amount Percent **Assets** Current assets..... \$ 550,000 \$ 533,000 \$ 17,000 3.2% 95,000 177,500 (82,500)(46.5%)Property, plant, and equipment (net) ..... 444,500 470,000 (25,500)(5.4%)Intangible assets ..... 50,000 50,000 Total assets ..... \$1,139,500 \$1,230,500 \$ (91,000) (7.4%)Liabilities (13.6%)100,000 (50.0%) 200,000 (100,000)\$ 443,000 Total liabilities ..... \$ 310,000 \$(133,000) (30.0%)Stockholders' Equity Preferred 6% stock, \$100 par ...... \$ 150,000 \$ 150,000 500,000 Common stock, \$10 par.... 500,000 Retained earnings..... 179,500 137,500 \$ 42,000 30.5% \$ 829,500 787,500 42,000 5.3% Total liabilities and stockholders' equity..... \$1,139,500 \$1,230,500 (91,000)(7.4%)

#### EXHIBIT 1

Comparative Balance Sheet—Horizontal Analysis

The balance sheets in Exhibit 1 may be expanded or supported by a separate schedule that includes the individual asset and liability accounts. For example, Exhibit 2 is a supporting schedule of **Lincoln Company**'s current asset accounts.

#### Lincoln Company **Comparative Schedule of Current Assets** December 31, 2016 and 2015 Dec. 31, Dec. 31, Increase (Decrease) 2016 2015 Percent Amount Cash ..... \$ 90,500 \$ 64,700 \$ 25,800 39.9% 15,000 25.0% Temporary investments..... 75,000 60,000 (4.2%)115,000 120,000 (5,000)Inventories ..... 264,000 283,000 (19,000)(6.7%)Prepaid expenses ..... 5,500 5,300 200 3.8% Total current assets..... \$550,000 \$533,000 \$ 17,000 3.2%

## EXHIBIT 2

Comparative Schedule of Current Assets—Horizontal Analysis

Exhibit 2 indicates that while cash and temporary investments increased, accounts receivable and inventories decreased. The decrease in accounts receivable could be caused by improved collection policies, which would increase cash. The decrease in inventories could be caused by increased sales.

Exhibit 3 illustrates horizontal analysis for the 2016 and 2015 income statements of **Lincoln Company**. Exhibit 3 indicates an increase in sales of \$296,500, or 24.0%. However, the percentage increase in sales of 24.0% was accompanied by an even greater percentage increase in the cost of goods (merchandise) sold of 27.2%. Thus, gross profit increased by only 19.7% rather than by the 24.0% increase in sales.

## **EXHIBIT 3**

Comparative Income Statement— Horizontal Analysis

Lincoln Company Comparative Income Statement For the Years Ended December 31, 2016 and 2015						
Increase (Decrease)						
	2016	2015	Amount	Percent		
Sales	\$1,498,000	\$1,200,000	\$298,000	24.8%		
Cost of goods sold	1,043,000	820,000	223,000	27.2%		
Gross profit	\$ 455,000	\$ 380,000	\$ 75,000	19.7%		
Selling expenses	\$ 191,000	\$ 147,000	\$ 44,000	29.9%		
Administrative expenses	104,000	97,400	6,600	6.8%		
Total operating expenses	\$ 295,000	\$ 244,400	\$ 50,600	20.7%		
Income from operations	\$ 160,000	\$ 135,600	\$ 24,400	18.0%		
Other income	8,500	11,000	(2,500)	(22.7%)		
	\$ 168,500	\$ 146,600	\$ 21,900	14.9%		
Other expense (interest)	6,000	12,000	(6,000)	(50.0%)		
Income before income tax	\$ 162,500	\$ 134,600	\$ 27,900	20.7%		
Income tax expense	71,500	58,100	13,400	23.1%		
Net income	\$ 91,000	\$ 76,500	\$ 14,500	19.0%		

Exhibit 3 also indicates that selling expenses increased by 29.9%. Thus, the 24.0% increases in sales could have been caused by an advertising campaign, which increased selling expenses. Administrative expenses increased by only 6.8%, total operating expenses increased by 20.7%, and income from operations increased by 18.0%. Interest expense decreased by 50.0%. This decrease was probably caused by the 50.0% decrease in long-term liabilities (Exhibit 1). Overall, net income increased by 19.0%, a favorable result.

Exhibit 4 illustrates horizontal analysis for the 2016 and 2015 retained earnings statements of **Lincoln Company**. Exhibit 4 indicates that retained earnings increased by 30.5% for the year. The increase is due to net income of \$91,000 for the year, less dividends of \$49,000.

## **EXHIBIT 4**

Comparative Retained Earnings Statement— Horizontal Analysis

Lincoln Company Comparative Retained Earnings Statement For the Years Ended December 31, 2016 and 2015						
			Increase (I	<u>-</u>		
	2016	2015	Amount	Percent		
Retained earnings, January 1	\$137,500	\$100,000	\$37,500	37.5%		
Net income for the year	91,000	76,500	14,500	19.0%		
Total	\$228,500	\$176,500	\$52,000	29.5%		
Dividends:						
On preferred stock	\$ 9,000	\$ 9,000	_	_		
On common stock	40,000	30,000	\$10,000	33.3%		
Total	\$ 49,000	\$ 39,000	\$10,000	25.6%		
Retained earnings, December 31	\$179,500	\$137,500	\$42,000	30.5%		

¹The term cost of goods sold is often used in practice in place of cost of merchandise sold. Such usage is followed in this chapter.

## Example Exercise 15-1 Horizontal Analysis

OBJ 1

The comparative cash and accounts receivable balances for a company follow:

	Dec. 31,	Dec. 31,	
	2016	2015	
Cash	\$62,500	\$50,000	
Accounts receivable (net)	74,400	80,000	

Based on this information, what is the amount and percentage of increase or decrease that would be shown on a balance sheet with horizontal analysis?

## Follow My Example 15-1

Cash \$12,500 increase (\$62,500 - \$50,000), or 25% Accounts receivable \$5,600 decrease (\$74,400 - \$80,000), or (7%)

Practice Exercises: PE 15-1A, PE 15-1B

# **Vertical Analysis**

The percentage analysis of the relationship of each component in a financial statement to a total within the statement is called **vertical analysis**. Although vertical analysis is applied to a single statement, it may be applied on the same statement over time. This enhances the analysis by showing how the percentages of each item have changed over time.

In vertical analysis of the balance sheet, the percentages are computed as follows:

• Each asset item is stated as a percent of the total assets.

Common stock, \$10 par.....

Retained earnings.....

Total liabilities and stockholders' equity.....

• Each liability and stockholders' equity item is stated as a percent of the total liabilities and stockholders' equity.

Exhibit 5 illustrates the vertical analysis of the December 31, 2016 and 2015, balance sheets of **Lincoln Company**. Exhibit 5 indicates that current assets have increased from 43.3% to 48.3% of total assets. Long-term investments decreased from 14.4% to 8.3% of total assets. Stockholders' equity increased from 64.0% to 72.8%, with a comparable decrease in liabilities.

Lincoln Company
Comparative Balance Sheet

December 31, 2016 and 2015

	Dec. 31	, 2016	Dec. 31	, 2015
	Amount	Percent	Amount	Percent
Assets				
Current assets	\$ 550,000	48.3%	\$ 533,000	43.3%
Long-term investments	95,000	8.3	177,500	14.4
Property, plant, and equipment (net)	444,500	39.0	470,000	38.2
Intangible assets	50,000	4.4	50,000	4.1
Total assets	\$1,139,500	100.0%	\$1,230,500	100.0%
Liabilities				
Current liabilities	\$ 210,000	18.4%	\$ 243,000	19.7%
Long-term liabilities	100,000	8.8	200,000	16.3
Total liabilities	\$ 310,000	27.2%	\$ 443,000	36.0%
Stockholders' Equity				
Preferred 6% stock, \$100 par	\$ 150,000	13.2%	\$ 150,000	12.2%

## **EXHIBIT 5**

Comparative
Balance Sheet—
Vertical Analysis

43.9

15.7

72.8%

100.0%

500,000

137,500

787,500

\$1,230,500

40.6

11.2

64.0%

100.0%

500,000

179,500

829,500

\$1,139,500

In a vertical analysis of the income statement, each item is stated as a percent of sales. Exhibit 6 illustrates the vertical analysis of the 2016 and 2015 income statements of **Lincoln Company**.

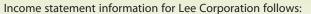
## EXHIBIT 6

Comparative Income Statement—Vertical Analysis

#### Lincoln Company **Comparative Income Statement** For the Years Ended December 31, 2016 and 2015 2016 2015 Amount **Percent** Amount **Percent** 100.0% 100.0% \$1,498,000 \$1,200,000 Cost of goods sold..... 1,043,000 69.6 820,000 68.3 \$ 455,000 Gross profit ..... 30.4% 380,000 31.7% Selling expenses ..... \$ 191,000 12.8% \$ 147,000 12.3% 6.9 __8.1 104,000 97,400 19.7% \$ 295,000 \$ 244,400 20.4% Total operating expenses ..... Income from operations ..... \$ 160,000 10.7% \$ 135,600 11.3% 8,500 0.6 11,000 0.9 \$ 168,500 11.3% \$ 146,600 12.2% 12,000 1.0 6,000 0.4 \$ 162,500 10.9% \$ 134,600 11.2% Income before income tax ..... Income tax expense ..... 71,500 4.8 58,100 4.8 91,000 6.1% 76,500 6.4%

Exhibit 6 indicates a decrease in the gross profit rate from 31.7% in 2015 to 30.4% in 2016. Although this is only a 1.3 percentage point (31.7% - 30.4%) decrease, in dollars of potential gross profit, it represents a decrease of \$19,474  $(1.3\% \times $1,498,000)$  based on 2016 sales. Thus, a small percentage decrease can have a large dollar effect.

# Example Exercise 15-2 Vertical Analysis



 Sales
 \$100,000

 Cost of goods sold
 65,000

 Gross profit
 \$ 35,000

Prepare a vertical analysis of the income statement for Lee Corporation.

## Follow My Example 15-2

	Amount	Percentage	
Sales	\$100,000	100%	(\$100,000 ÷ \$100,000)
Cost of goods sold	65,000	65	(\$65,000 ÷ \$100,000)
Gross profit	\$ 35,000	35%	(\$35,000 ÷ \$100,000)

Practice Exercises: PE 15-2A, PE 15-2B

## **Common-Sized Statements**

In a **common-sized statement**, all items are expressed as percentages, with no dollar amounts shown. Common-sized statements are often useful for comparing one company with another or for comparing a company with industry averages.

Exhibit 7 illustrates common-sized income statements for **Lincoln Company** and Madison Corporation. Exhibit 7 indicates that Lincoln has a slightly higher rate of gross profit (30.4%) than Madison (30.0%). However, Lincoln has a higher percentage of selling expenses (12.8%) and administrative expenses (6.9%) than does Madison (11.5% and 4.1%). As a result, the income from operations of Lincoln (10.7%) is less than that of Madison (14.4%).

	Lincoln Company	Madison Corporation
Sales	100.0%	100.0%
Cost of goods sold	69.6	70.0
Gross profit	30.4%	30.0%
Selling expenses	12.8%	11.5%
Administrative expenses	6.9	4.1
Total operating expenses	19.7%	15.6%
Income from operations	10.7%	14.4%
Other income	0.6	0.6
	11.3%	15.0%
Other expense (interest)	0.4	0.5
Income before income tax	10.9%	14.5%
Income tax expense	4.8	5.5
Net income	6.1%	9.0%

## **EXHIBIT 7**

Common-Sized Income Statements

The unfavorable difference of 3.7 (14.4% – 10.7%) percentage points in income from operations would concern the managers and other stakeholders of Lincoln. The underlying causes of the difference should be investigated and possibly corrected. For example, Lincoln may decide to outsource some of its administrative duties so that its administrative expenses are more comparative to that of Madison.

# **Other Analytical Measures**

Other relationships may be expressed in ratios and percentages. Often, these relationships are compared within the same statement and, thus, are a type of vertical analysis. Comparing these items with items from earlier periods is a type of horizontal analysis.

Analytical measures are not a definitive conclusion. They are only guides in evaluating financial and operating data. Many other factors, such as trends in the industry and general economic conditions, should also be considered when analyzing a company.

# **Liquidity and Solvency Analysis**

All users of financial statements are interested in the ability of a company to do the following:

- Maintain liquidity and solvency
- Earn income, called profitability

The ability of a company to convert assets into cash is called **liquidity**, while the ability of a company to pay its debts is called **solvency**. Liquidity, solvency, and profitability are interrelated. For example, a company that cannot convert assets into cash may have difficulty taking advantage of profitable courses of action requiring immediate cash outlays. Likewise, a company that cannot pay its debts will have difficulty obtaining credit. A lack of credit will, in turn, limit the company's ability to purchase merchandise or expand operations, which decreases its profitability.



Liquidity and solvency are normally assessed using the following:

- Current position analysis
  - Working capital
  - Current ratio
  - Quick ratio
- Accounts receivable analysis
  - Accounts receivable turnover
  - Number of days' sales in receivables
- Inventory analysis
  - Inventory turnover
  - · Number of days' sales in inventory
- The ratio of fixed assets to long-term liabilities
- The ratio of liabilities to stockholders' equity
- The number of times interest charges are earned

The Lincoln Company financial statements presented earlier are used to illustrate the preceding analyses.

# **Current Position Analysis**

A company's ability to pay its current liabilities is called **current position analysis**. It is a solvency measure of special interest to short-term creditors and includes the computation and analysis of the following:

- Working capital
- Current ratio
- Quick ratio

Working Capital A company's working capital is computed as follows:

Working Capital = Current Assets - Current Liabilities

To illustrate, the working capital for **Lincoln Company** for 2016 and 2015 is computed as follows:

	2016	2015
Current assets	\$550,000	\$533,000
Less current liabilities	210,000	243,000
Working capital	\$340,000	\$290,000

The working capital is used to evaluate a company's ability to pay current liabilities. A company's working capital is often monitored monthly, quarterly, or yearly by creditors and other debtors. However, it is difficult to use working capital to compare companies of different sizes. For example, working capital of \$250,000 may be adequate for a local hardware store, but it would be inadequate for The Home Depot.

**Current Ratio** The current ratio, sometimes called the *working capital ratio*, is computed as follows:

$$Current Ratio = \frac{Current Assets}{Current Liabilities}$$

To illustrate, the current ratio for Lincoln Company is computed as follows:

	2016	2015
Current assets	\$550,000	\$533,000
Current liabilities	\$210,000	\$243,000
Current ratio	2.6 (\$550,000 ÷ \$210,000)	2.2 (\$533,000 ÷ \$243,000)

Annual Statement Studies from Risk Management Association. Online analysis is available from Zacks Investment Research site at www.zacks.com.

One popular

printed source for

industry ratios is

The current ratio is a more reliable indicator of a company's ability to pay its current liabilities than is working capital, and it is much easier to compare across companies. To illustrate, assume that as of December 31, 2016, the working capital of a competitor is much greater than \$340,000, but its current ratio is only 1.3. Considering these facts alone, Lincoln, with its current ratio of 2.6, is in a more favorable position to obtain short-term credit than the competitor, which has the greater amount of working capital.

**Quick Ratio** One limitation of working capital and the current ratio is that they do not consider the types of current assets a company has and how easily they can be turned in to cash. Because of this, two companies may have the same working capital and current ratios but differ significantly in their ability to pay their current liabilities.

To illustrate, the current assets and liabilities for **Lincoln Company** and Jefferson Corporation as of December 31, 2016, are as follows:

	Lincoln Company	Jefferson Corporation
Current assets:		
Cash	\$ 90,500	\$ 45,500
Temporary investments	75,000	25,000
Accounts receivable (net)	115,000	90,000
Inventories	264,000	380,000
Prepaid expenses	5,500	9,500
Total current assets	\$550,000	\$550,000
Total current assets	\$550,000	\$550,000
Less current liabilities	210,000	210,000
Working capital	\$340,000	\$340,000
Current ratio (\$550,000 ÷ \$210,000)	2.6	2.6

Lincoln and Jefferson both have a working capital of \$340,000 and current ratios of 2.6. Jefferson, however, has more of its current assets in inventories. These inventories must be sold and the receivables collected before all the current liabilities can be paid. This takes time. In addition, if the market for its product declines, Jefferson may have difficulty selling its inventory. This, in turn, could impair its ability to pay its current liabilities.

In contrast, Lincoln's current assets contain more cash, temporary investments, and accounts receivable, which can easily be converted to cash. Thus, Lincoln is in a stronger current position than Jefferson to pay its current liabilities.

A ratio that measures the "instant" debt-paying ability of a company is the **quick ratio**, sometimes called the *acid-test ratio*. The quick ratio is computed as follows:

$$Quick Ratio = \frac{Quick Assets}{Current Liabilities}$$

**Quick assets** are cash and other current assets that can be easily converted to cash. Quick assets normally include cash, temporary investments, and receivables but exclude inventories and prepaid assets.

To illustrate, the quick ratio for Lincoln Company is computed as follows:

	2016	2015
Quick assets:		
Cash	\$ 90,500	\$ 64,700
Temporary investments	75,000	60,000
Accounts receivable (net)	115,000	120,000
Total quick assets	\$280,500	\$244,700
Current liabilities	\$210,000	\$243,000
Quick ratio	1.3 (\$280,500 ÷ \$210,000)	1.0 (\$244,700 ÷ \$243,000)

## Example Exercise 15-3 Current Position Analysis

The following items are reported on a company's balance sheet:

 Cash
 \$300,000

 Temporary investments
 100,000

 Accounts receivable (net)
 200,000

 Inventory
 200,000

 Accounts payable
 400,000

Determine (a) the current ratio and (b) the quick ratio.

## Follow My Example 15-3

- a. Current Ratio = Current Assets ÷ Current Liabilities
  - $= (\$300,000 + \$100,000 + \$200,000 + \$200,000) \div \$400,000$
  - = 2.0
- b. Quick Ratio = Quick Assets ÷ Current Liabilities
  - $= (\$300,000 + \$100,000 + \$200,000) \div \$400,000$
  - = 1.5

Practice Exercises: PE 15-3A, PE 15-3B

# **Accounts Receivable Analysis**

A company's ability to collect its accounts receivable is called **accounts receivable analysis**. It includes the computation and analysis of the following:

- · Accounts receivable turnover
- Number of days' sales in receivables

Collecting accounts receivable as quickly as possible improves a company's liquidity. In addition, the cash collected from receivables may be used to improve or expand operations. Quick collection of receivables also reduces the risk of uncollectible accounts.

**Accounts Receivable Turnover** The accounts receivable turnover is computed as follows:

$$Accounts \ Receivable \ Turnover = \frac{Sales^2}{Average \ Accounts \ Receivable}$$

To illustrate, the accounts receivable turnover for **Lincoln Company** for 2016 and 2015 is computed as follows. Lincoln's accounts receivable balance at the beginning of 2015 is \$140,000.

	2016	2015
Sales	\$1,498,000	\$1,200,000
Accounts receivable (net):		
Beginning of year	\$ 120,000	\$ 140,000
End of year	115,000	120,000
Total	\$ 235,000	\$ 260,000
Average accounts receivable	\$117,500 (\$235,000 ÷ 2)	\$130,000 (\$260,000 ÷ 2)
Accounts receivable turnover	12.7 (\$1,498,000 ÷ \$117,500)	9.2 (\$1,200,000 ÷ \$130,000)

The increase in Lincoln's accounts receivable turnover from 9.2 to 12.7 indicates that the collection of receivables has improved during 2016. This may be due to a change in how credit is granted, collection practices, or both.

² If known, *credit* sales should be used in the numerator. Because credit sales are not normally known by external users, we use sales in the numerator.

For Lincoln, the average accounts receivable was computed using the accounts receivable balance at the beginning and the end of the year. When sales are seasonal and, thus, vary throughout the year, monthly balances of receivables are often used. Also, if sales on account include notes receivable as well as accounts receivable, notes and accounts receivable are normally combined for analysis.

Number of Days' Sales in Receivables The number of days' sales in receivables is computed as follows:

$$Number of Days' Sales in Receivables = \frac{Average Accounts Receivable}{Average Daily Sales}$$

where

Average Daily Sales = 
$$\frac{\text{Sales}}{365 \text{ days}}$$

To illustrate, the number of days' sales in receivables for **Lincoln Company** is computed as follows:

	2016	2015
Average accounts receivable	\$117,500 (\$235,000 ÷ 2)	\$130,000 (\$260,000 ÷ 2)
Average daily sales	\$4,104 (\$1,498,000 ÷ 365)	\$3,288 (\$1,200,000 ÷ 365)
Number of days' sales in receivables	28.6 (\$117,500 ÷ \$4,104)	39.5 (\$130,000 ÷ \$3,288)

The number of days' sales in receivables is an estimate of the time (in days) that the accounts receivable have been outstanding. The number of days' sales in receivables is often compared with a company's credit terms to evaluate the efficiency of the collection of receivables.

To illustrate, if Lincoln's credit terms are 2/10, n/30, then Lincoln was very *inefficient* in collecting receivables in 2015. In other words, receivables should have been collected in 30 days or less but were being collected in 39.5 days. Although collections improved during 2016 to 28.6 days, there is probably still room for improvement. On the other hand, if Lincoln's credit terms are n/45, then there is probably little room for improving collections.

# Example Exercise 15-4 Accounts Receivable Analysis



A company reports the following:

Sales \$960,000 Average accounts receivable (net) 48,000

Determine (a) the accounts receivable turnover and (b) the number of days' sales in receivables. Round to one decimal place.

## Follow My Example 15-4

a. Accounts Receivable Turnover = Sales  $\div$  Average Accounts Receivable

= \$960,000 ÷ \$48,000

= 20.0

b. Number of Days' Sales in Receivables = Average Accounts Receivable ÷ Average Daily Sales

 $= $48,000 \div ($960,000 \div 365) = $48,000 \div $2,630$ 

= 18.3 days

Practice Exercises: PE 15-4A, PE 15-4B

# **Inventory Analysis**

A company's ability to manage its inventory effectively is evaluated using **inventory analysis**. It includes the computation and analysis of the following:

- Inventory turnover
- Number of days' sales in inventory

Excess inventory decreases liquidity by tying up funds (cash) in inventory. In addition, excess inventory increases insurance expense, property taxes, storage costs, and other related expenses. These expenses further reduce funds that could be used elsewhere to improve or expand operations.

Excess inventory also increases the risk of losses because of price declines or obsolescence of the inventory. On the other hand, a company should keep enough inventory in stock so that it doesn't lose sales because of lack of inventory.

#### **Inventory Turnover** The **inventory turnover** is computed as follows:

$$Inventory Turnover = \frac{Cost of Goods Sold}{Average Inventory}$$

To illustrate, the inventory turnover for **Lincoln Company** for 2016 and 2015 is computed as follows. Lincoln's inventory balance at the beginning of 2015 is \$311,000.

	2016	2015
Cost of goods sold	\$1,043,000	\$820,000
Inventories:		
Beginning of year	\$ 283,000	\$311,000
End of year	264,000	283,000
Total	\$ 547,000	\$594,000
Average inventory	\$273,500 (\$547,000 ÷ 2)	\$297,000 (\$594,000 ÷ 2)
Inventory turnover	3.8 (\$1,043,000 ÷ \$273,500)	2.8 (\$820,000 ÷ \$297,000)

The increase in Lincoln's inventory turnover from 2.8 to 3.8 indicates that the management of inventory has improved in 2016. The inventory turnover improved because of an increase in the cost of goods sold, which indicates more sales and a decrease in the average inventories.

What is considered a good inventory turnover varies by type of inventory, companies, and industries. For example, grocery stores have a higher inventory turnover than jewelers or furniture stores. Likewise, within a grocery store, perishable foods have a higher turnover than the soaps and cleansers.

# **Number of Days' Sales in Inventory** The number of days' sales in inventory is computed as follows:

where

Average Daily Cost of Goods Sold = 
$$\frac{\text{Cost of Goods Sold}}{365 \text{ days}}$$

To illustrate, the number of days' sales in inventory for **Lincoln Company** is computed as follows:

	2016	2015
Average inventory	\$273,500 (\$547,000 ÷ 2)	\$297,000 (\$594,000 ÷ 2)
Average daily cost of goods sold	\$2,858 (\$1,043,000 ÷ 365)	\$2,247 (\$820,000 ÷ 365)
Number of days' sales in inventory	95.7 (\$273,500 ÷ \$2,858)	132.2 (\$297,000 ÷ \$2,247)

The number of days' sales in inventory is a rough measure of the length of time it takes to purchase, sell, and replace the inventory. Lincoln's number of days' sales in inventory improved from 132.2 days to 95.7 days during 2016. This is a major improvement in managing inventory.

## Example Exercise 15-5 Inventory Analysis

**2** OBJ

A company reports the following:

Cost of goods sold \$560,000 Average inventory 112,000

Determine (a) the inventory turnover and (b) the number of days' sales in inventory. Round to one decimal place.

## Follow My Example 15-5

a. Inventory Turnover = Cost of Goods Sold  $\div$  Average Inventory =  $\$560,000 \div \$112,000$ 

= 5.0

b. Number of Days' Sales in Inventory = Average Inventory ÷ Average Daily Cost of Goods Sold

= \$112,000  $\div$  (\$560,000  $\div$  365) = \$112,000  $\div$  \$1,534

= 73.0 days

Practice Exercises: PE 15-5A, PE 15-5B

# **Ratio of Fixed Assets to Long-Term Liabilities**

The ratio of fixed assets to long-term liabilities provides a measure of whether noteholders or bondholders will be paid. Because fixed assets are often pledged as security for long-term notes and bonds, it is computed as follows:

Ratio of Fixed Assets to Long-Term Liabilities =  $\frac{\text{Fixed Assets (net)}}{\text{Long-Term Liabilities}}$ 

To illustrate, the ratio of fixed assets to long-term liabilities for **Lincoln Company** is computed as follows:

	2016	2015
Fixed assets (net)	\$444,500	\$470,000
Long-term liabilities	\$100,000	\$200,000
Ratio of fixed assets to		
long-term liabilities	4.4 (\$444,500 ÷ \$100,000)	2.4 (\$470,000 ÷ \$200,000)

During 2016, Lincoln's ratio of fixed assets to long-term liabilities increased from 2.4 to 4.4. This increase was due primarily to Lincoln paying off one-half of its long-term liabilities in 2016.

# **Ratio of Liabilities to Stockholders' Equity**

The ratio of liabilities to stockholders' equity measures how much of the company is financed by debt and equity. It is computed as follows:

Ratio of Liabilities to Stockholders' Equity = 
$$\frac{\text{Total Liabilities}}{\text{Total Stockholders' Equity}}$$

To illustrate, the ratio of liabilities to stockholders' equity for **Lincoln Company** is computed as follows:

	2016	2015
Total liabilities	\$310,000	\$443,000
Total stockholders' equity	\$829,500	\$787,500
Ratio of liabilities to		
stockholders' equity	0.4 (\$310,000 ÷ \$829,500)	0.6 (\$443,000 ÷ \$787,500)

Lincoln's ratio of liabilities to stockholders' equity decreased from 0.6 to 0.4 during 2016. This is an improvement and indicates that Lincoln's creditors have an adequate margin of safety.

## Example Exercise 15-6 Long-Term Solvency Analysis



The following information was taken from Acme Company's balance sheet:

Fixed assets (net) \$1,400,000 Long-term liabilities 400,000 Total liabilities 560,000 Total stockholders' equity 1,400,000

Determine the company's (a) ratio of fixed assets to long-term liabilities and (b) ratio of liabilities to total stockholders' equity.

## Follow My Example 15-6

a. Ratio of Fixed Assets to Long-Term Liabilities = Fixed Assets ÷ Long-Term Liabilities

 $= $1,400,000 \div $400,000$ 

= 3.5

b. Ratio of Liabilities to Total Stockholders' Equity = Total Liabilities ÷ Total Stockholders' Equity

 $= $560,000 \div $1,400,000$ 

.....

= 0.4

Practice Exercises: PE 15-6A, PE 15-6B

# **Number of Times Interest Charges Are Earned**

The **number of times interest charges are earned**, sometimes called the *fixed charge coverage ratio*, measures the risk that interest payments will not be made if earnings decrease. It is computed as follows:

$$\mbox{Number of Times Interest Charges Are Earned} = \frac{\mbox{Income Before Income Tax + Interest Expense}}{\mbox{Interest Expense}}$$

Interest expense is paid before income taxes. In other words, interest expense is deducted in determining taxable income and, thus, income tax. For this reason, income *before taxes* is used in computing the number of times interest charges are earned.

The *higher* the ratio the more likely interest payments will be paid if earnings decrease. To illustrate, the number of times interest charges are earned for **Lincoln Company** is computed as follows:

	2016	2015
Income before income tax	\$162,500	\$134,600
Add interest expense	6,000	12,000
Amount available to pay interest  Number of times interest charges	\$168,500	\$146,600
are earned	28.1 (\$168,500 ÷ \$6,000)	12.2 (\$146,600 ÷ \$12,000)

The number of times interest charges are earned improved from 12.2 to 28.1 during 2016. This indicates that Lincoln has sufficient earnings to pay interest expense.

The number of times interest charges are earned can be adapted for use with dividends on preferred stock. In this case, the *number of times preferred dividends* are earned is computed as follows:

Since dividends are paid after taxes, net income is used in computing the number of times preferred dividends are earned. The *higher* the ratio, the more likely preferred dividend payments will be paid if earnings decrease.

## Example Exercise 15-7 Times Interest Charges Are Earned

OBJ 2

A company reports the following:

Income before income tax \$250,000 Interest expense 100,000

Determine the number of times interest charges are earned.

## Follow My Example 15-7

Number of Times Interest Charges Are Earned = (Income Before Income Tax + Interest Expense)  $\div$  Interest Expense = (\$250,000 + \$100,000)  $\div$  \$100,000 = 3.5

Practice Exercises: PE 15-7A, PE 15-7B

# **Profitability Analysis**

Profitability analysis focuses on the ability of a company to earn profits. This ability is reflected in the company's operating results, as reported in its income statement. The ability to earn profits also depends on the assets the company has available for use in its operations, as reported in its balance sheet. Thus, income statement and balance sheet relationships are often used in evaluating profitability.

Common profitability analyses include the following:

- · Ratio of sales to assets
- Rate earned on total assets
- · Rate earned on stockholders' equity
- · Rate earned on common stockholders' equity
- Earnings per share on common stock
- Price-earnings ratio
- Dividends per share
- Dividend yield

## **Ratio of Sales to Assets**

The ratio of sales to assets measures how effectively a company uses its assets. It is computed as follows:

Ratio of Sales to Assets = Sales

Average Total Assets

(excluding long-term investments)

Note that any long-term investments are excluded in computing the ratio of sales to assets. This is because long-term investments are unrelated to normal operations and sales.

To illustrate, the ratio of sales to assets for **Lincoln Company** is computed as follows. Total assets (excluding long-term investments) are \$1,010,000 at the beginning of 2015.

	2016	2015
Sales	\$1,498,000	\$1,200,000
Total assets (excluding long-term investments):		
Beginning of year	\$1,053,000*	\$1,010,000
End of year	_1,044,500**	_1,053,000*
Total	\$2,097,500	\$2,063,000
Average total assets	\$1,048,750 (\$2,097,500 ÷ 2)	\$1,031,500 (\$2,063,000 ÷ 2)
Ratio of sales to assets	1.4 (\$1,498,000 ÷ \$1,048,750)	1.2 (\$1,200,000 ÷ \$1,031,500)
*(\$1,230,500 – \$177,500)		
**(\$1,139,500 – \$95,000)		



#### Note:

Profitability analysis focuses on the relationship between operating results and the resources available to a business.

For Lincoln, the average total assets was computed using total assets (excluding long-term investments) at the beginning and end of the year. The average total assets could also be based on monthly or quarterly averages.

The ratio of sales to assets indicates that Lincoln's use of its operating assets has improved in 2016. This was primarily due to the increase in sales in 2016.

## Example Exercise 15-8 Sales to Assets

(3)

A company reports the following:

Sales \$2,250,000 Average total assets 1,500,000

Determine the ratio of sales to assets.

## Follow My Example 15-8

Ratio of Sales to Assets = Sales ÷ Average Total Assets = \$2,250,000 ÷ \$1,500,000

Practice Exercises: PE 15-8A, PE 15-8B

## **Rate Earned on Total Assets**

The rate earned on total assets measures the profitability of total assets, without considering how the assets are financed. In other words, this rate is not affected by the portion of assets financed by creditors or stockholders. It is computed as follows:

The rate earned on total assets is computed by adding interest expense to net income. By adding interest expense to net income, the effect of whether the assets are financed by creditors (debt) or stockholders (equity) is eliminated. Because net income includes any income earned from long-term investments, the average total assets includes long-term investments as well as the net operating assets.

To illustrate, the rate earned on total assets by **Lincoln Company** is computed as follows. Total assets are \$1,187,500 at the beginning of 2015.

	2016	2015
Net income	\$ 91,000	\$ 76,500
Plus interest expense	6,000	12,000
Total	\$ 97,000	\$ 88,500
Total assets:		
Beginning of year	\$1,230,500	\$1,187,500
End of year	1,139,500	1,230,500
Total	\$2,370,000	\$2,418,000
Average total assets	\$1,185,000 (\$2,370,000 ÷ 2)	\$1,209,000 (\$2,418,000 ÷ 2)
Rate earned on total assets	8.2% (\$97,000 ÷ \$1,185,000)	7.3% (\$88,500 ÷ \$1,209,000)

The rate earned on total assets improved from 7.3% to 8.2% during 2016.

The *rate earned on operating assets* is sometimes computed when there are large amounts of nonoperating income and expense. It is computed as follows:

Because Lincoln Company does not have a significant amount of nonoperating income and expense, the rate earned on operating assets is not illustrated.

## Example Exercise 15-9 Rate Earned on Total Assets

OBJ 3

A company reports the following income statement and balance sheet information for the current year:

Net income\$ 125,000Interest expense25,000Average total assets2,000,000

Determine the rate earned on total assets.

## Follow My Example 15-9

Rate Earned on Total Assets = (Net Income + Interest Expense)  $\div$  Average Total Assets = ( $\$125,000 + \$25,000) \div \$2,000,000$  =  $\$150,000 \div \$2,000,000$  = 7.5%

Practice Exercises: PE 15-9A, PE 15-9B

## Rate Earned on Stockholders' Equity

The rate earned on stockholders' equity measures the rate of income earned on the amount invested by the stockholders. It is computed as follows:

Rate Earned on Stockholders' Equity = 

Net Income

Average Total Stockholders' Equity

To illustrate, the rate earned on stockholders' equity for **Lincoln Company** is computed as follows. Total stockholders' equity is \$750,000 at the beginning of 2015.

	2016	2015
Net income	\$ 91,000	\$ 76,500
Stockholders' equity:	<del></del>	
Beginning of year	\$ 787,500	\$ 750,000
End of year	829,500	787,500
Total	\$1,617,000	\$1,537,500
Average stockholders' equity	\$808,500 (\$1,617,000 ÷ 2)	\$768,750 (\$1,537,500 ÷ 2)
Rate earned on stockholders' equity	11.3% (\$91,000 ÷ \$808,500)	10.0% (\$76,500 ÷ \$768,750)

The rate earned on stockholders' equity improved from 10.0% to 11.3% during 2016. **Leverage** involves using debt to increase the return on an investment. The rate earned on stockholders' equity is normally higher than the rate earned on total assets. This is because of the effect of leverage.

For **Lincoln Company**, the effect of leverage for 2016 is 3.1% and for 2015 is 2.7% computed as follows:

	2016	2015
Rate earned on stockholders' equity	11.3%	10.0%
Less rate earned on total assets	8.2	7.3
Effect of leverage	<u>3.1</u> %	2.7%

Exhibit 8 shows the 2016 and 2015 effects of leverage for Lincoln.

# Rate Earned on Common Stockholders' Equity

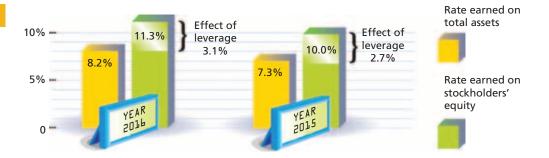
The rate earned on common stockholders' equity measures the rate of profits earned on the amount invested by the common stockholders. It is computed as follows:

Rate Earned on Common Stockholders' Equity = Net Income – Preferred Dividends

Average Common Stockholders' Equity

**EXHIBIT 8** 

**Effect of Leverage** 



Because preferred stockholders rank ahead of the common stockholders in their claim on earnings, any preferred dividends are subtracted from net income in computing the rate earned on common stockholders' equity.

**Lincoln Company** had \$150,000 of 6% preferred stock outstanding on December 31, 2016 and 2015. Thus, preferred dividends of  $$9,000 ($150,000 \times 6\%)$  are deducted from net income. Lincoln's common stockholders' equity is determined as follows:

	December 31		
	2016	2015	2014
Common stock, \$10 par	\$500,000	\$500,000	\$500,000
Retained earnings	179,500	137,500	100,000
Common stockholders' equity	\$679,500	\$637,500	\$600,000

The retained earnings on December 31, 2014, of \$100,000 is the same as the retained earnings on January 1, 2015, as shown in Lincoln's retained earnings statement in Exhibit 4.

Using this information, the rate earned on common stockholders' equity for Lincoln is computed as follows:

	2016	2015
Net income	\$ 91,000	\$ 76,500
Less preferred dividends	9,000	9,000
Total	\$ 82,000	\$ 67,500
Common stockholders' equity:		
Beginning of year	\$ 637,500	\$ 600,000
End of year	679,500*	637,500**
Total	\$1,317,000	\$1,237,500
Average common		
stockholders' equity	\$658,500 (\$1,317,000 ÷ 2)	\$618,750 (\$1,237,500 ÷ 2)
Rate earned on common		
stockholders' equity	12.5% (\$82,000 ÷ \$658,500)	10.9% (\$67,500 ÷ \$618,750)
*(\$829,500 – \$150,000)		
**(\$787,500 – \$150,000)		

Lincoln's rate earned on common stockholders' equity improved from 10.9% to 12.5% in 2016. This rate differs from the rates earned by Lincoln on total assets and stockholders' equity, which follow:

	2016	2015
Rate earned on total assets	8.2%	7.3%
Rate earned on stockholders' equity	11.3%	10.0%
Rate earned on common stockholders' equity	12.5%	10.9%

These rates differ because of leverage, as discussed in the preceding section.

## Example Exercise 15-10 Common Stockholders' Profitability Analysis

OBJ 3

A company reports the following:

Net income\$ 125,000Preferred dividends5,000Average stockholders' equity1,000,000Average common stockholders' equity800,000

Determine (a) the rate earned on stockholders' equity and (b) the rate earned on common stockholders' equity.

## Follow My Example 15-10

a. Rate Earned on Stockholders' Equity = Net Income ÷ Average Stockholders' Equity

= \$125,000 ÷ \$1,000,000

= 12.5%

b. Rate Earned on Common Stockholders' Equity = (Net Income – Preferred Dividends) ÷ Average

Common Stockholders' Equity

 $= (\$125,000 - \$5,000) \div \$800,000$ 

= 15%

Practice Exercises: PE 15-10A, PE 15-10B

# **Earnings per Share on Common Stock**

Earnings per share (EPS) on common stock measures the share of profits that are earned by a share of common stock. Earnings per share must be reported in the income statement. As a result, earnings per share (EPS) is often reported in the financial press. It is computed as follows:

When preferred and common stock are outstanding, preferred dividends are subtracted from net income to determine the income related to the common shares.

To illustrate, the earnings per share (EPS) of common stock for **Lincoln Company** is computed as follows:

	2016	2015
Net income	\$91,000	\$76,500
Preferred dividends	9,000	9,000
Total	\$82,000	\$67,500
Shares of common		
stock outstanding	50,000	50,000
Earnings per share		
on common stock	\$1.64 (\$82,000 ÷ 50,000)	\$1.35 (\$67,500 ÷ 50,000)

Lincoln had \$150,000 of 6% preferred stock outstanding on December 31, 2016 and 2015. Thus, preferred dividends of \$9,000 ( $$150,000 \times 6$ %) are deducted from net income in computing earnings per share on common stock.

Lincoln did not issue any additional shares of common stock in 2016. If Lincoln had issued additional shares in 2016, a weighted average of common shares outstanding during the year would have been used.

Lincoln's earnings per share (EPS) on common stock improved from \$1.35 to \$1.64 during 2016.

Lincoln Company has a simple capital structure with only common stock and preferred stock outstanding. Many corporations, however, have complex capital structures with various types of equity securities outstanding, such as convertible preferred stock, stock options, and stock warrants. In such cases, the possible effects of such securities on the shares of common stock outstanding are considered in reporting earnings per share. These possible effects are reported separately as *earnings per common share assuming dilution* or *diluted earnings per share*. This topic is described and illustrated in advanced accounting courses and textbooks.

# **Price-Earnings Ratio**

The **price-earnings (P/E) ratio** on common stock measures a company's future earnings prospects. It is often quoted in the financial press and is computed as follows:

To illustrate, the price-earnings (P/E) ratio for **Lincoln Company** is computed as follows:

	2016	2015
Market price per share of common stock	\$41.00	\$27.00
Earnings per share on common stock	\$1.64	\$1.35
Price-earnings ratio on common stock	25 (\$41 ÷ \$1.64)	20 (\$27 ÷ \$1.35)

The price-earnings ratio improved from 20 to 25 during 2016. In other words, a share of common stock of Lincoln was selling for 20 times earnings per share at the end of 2015. At the end of 2016, the common stock was selling for 25 times earnings per share. This indicates that the market expects Lincoln to experience favorable earnings in the future.

# Example Exercise 15-11 Earnings per Share and Price-Earnings Ratio



A company reports the following:

Net income	\$250,000
Preferred dividends	\$15,000
Shares of common stock outstanding	20,000
Market price per share of common stock	\$35.25

- a. Determine the company's earnings per share on common stock.
- b. Determine the company's price-earnings ratio. Round to one decimal place.

## Follow My Example 15-11

a. Earnings per Share on Common Stock = (Net Income – Preferred Dividends) ÷ Shares of Common Stock Outstanding

$$= (\$250,000 - \$15,000) \div 20,000$$

= \$11.75

b. Price-Earnings Ratio = Market Price per Share of Common Stock ÷ Earnings per Share on Common Stock

 $= $35.25 \div $11.75$ 

= 3.0

Practice Exercises: PE 15-11A, PE 15-11B

# **Dividends per Share**

**Dividends per share** measures the extent to which earnings are being distributed to common shareholders. It is computed as follows:

Dividends per Share = Dividends on Common Stock

Shares of Common Stock Outstanding

To illustrate, the dividends per share for Lincoln Company are computed as follows:

	2016	2015
Dividends on common stock	\$40,000	\$30,000
Shares of common stock outstanding	50,000	50,000
Dividends per share of common stock	\$0.80 (\$40,000 ÷ 50,000)	\$0.60 (\$30,000 ÷ 50,000)

The dividends per share of common stock increased from \$0.60 to \$0.80 during 2016. Dividends per share are often reported with earnings per share. Comparing the two per-share amounts indicates the extent to which earnings are being retained for use in operations. To illustrate, the dividends and earnings per share for Lincoln **Company** are shown in Exhibit 9.



## **EXHIBIT 9**

**Dividends and Earnings per Share** of Common Stock

## **Dividend Yield**

The dividend yield on common stock measures the rate of return to common stockholders from cash dividends. It is of special interest to investors whose objective is to earn revenue (dividends) from their investment. It is computed as follows:

> Dividends per Share of Common Stock Dividend Yield = Market Price per Share of Common Stock

To illustrate, the dividend yield for **Lincoln Company** is computed as follows:

	2016	2015
Dividends per share of common stock	\$0.80	\$0.60
Market price per share of common stock	\$41.00	\$27.00
Dividend yield on common stock	2.0% (\$0.80 ÷ \$41)	2.2% (\$0.60 ÷ \$27)

The dividend yield declined slightly from 2.2% to 2.0% in 2016. This decline was primarily due to the increase in the market price of Lincoln's common stock.

# **Summary of Analytical Measures**

Exhibit 10 shows a summary of the solvency and profitability measures discussed in this chapter. The type of industry and the company's operations usually affect which measures are used. In many cases, additional measures are used for a specific industry. For example, airlines use revenue per passenger mile and cost per available seat as profitability measures. Likewise, hotels use occupancy rates as a profitability measure.

The analytical measures shown in Exhibit 10 are a useful starting point for analyzing a company's solvency and profitability. However, they are not a substitute for sound judgment. For example, the general economic and business environment should always be considered in analyzing a company's future prospects. In addition, any trends and interrelationships among the measures should be carefully studied.



The dividends per share, dividend yield, and P/E

ratio of a common stock are normally quoted on the daily listing of stock prices in The Wall Street Journal and on Yahoo!'s finance Web site.

## **EXHIBIT 10**

## **Summary of Analytical Measures**

	Method of Computation	Use
Working Capital	Current Assets – Current Liabilities	
Current Ratio	Current Assets	To indicate the ability to meet currently maturing obligations (measures solvency)
	Current Liabilities	maturing obligations (measures solvency)
O tal Burt	Quick Assets	To indicate instant debt-paying ability
Quick Ratio	Current Liabilities	(measures solvency)
Accounts Receivable	Sales	
Turnover	Average Accounts Receivable	To assess the efficiency in collecting
Numbers of Days' Sales in	Average Accounts Receivable	receivables and in the management of credit (measures liquidity)
Receivables	Average Daily Sales	
Inventory Turnover	Cost of Goods Sold	
inventory furnover	Average Inventory	To assess the efficiency in the management
Number of Days' Sales in	Average Inventory	of inventory (measures liquidity)
Inventory	Average Daily Cost of Goods Sold	J
Ratio of Fixed Assets to	Fixed Assets (net)	To indicate the margin of safety to
Long-Term Liabilities	Long-Term Liabilities	long-term creditors (measures solvency)
Ratio of Liabilities to	Total Liabilities	To indicate the margin of safety to creditors
Stockholders' Equity	Total Stockholders' Equity	(measures solvency)
Number of Times Interest	Income Before	To assess the risk to debtholders in terms
Charges Are Earned	Income Tax + Interest Expense	of number of times interest charges were
	Interest Expense	earned (measures solvency)
Number of Times  Preferred Dividends	Net Income	To assess the risk to preferred stockholders in terms of the number of times preferred
Are Earned	Preferred Dividends	dividends were earned (measures solvency)
	Sales	· ·
Ratio of Sales to Assets	Average Total Assets (excluding	To assess the effectiveness in the use of assets
to Assets	long-term investments)	OI dssets
Rate Earned on	Net Income + Interest Expense	To account the profitability of the account
Total Assets	Average Total Assets	To assess the profitability of the assets
Rate Earned on	Net Income	To assess the profitability of the investment
Stockholders' Equity	Average Total Stockholders' Equity	by stockholders
Rate Earned on Common	Net Income – Preferred Dividends	
Stockholders' Equity	Average Common Stockholders' Equity	To assess the profitability of the investment
Earnings per Share (EPS)	Net Income – Preferred Dividends	by common stockholders
on Common Stock	Shares of Common Stock Outstanding	
	Market Price per Share of Common Stock	To indicate future earnings prospects, based
Price-Earnings (P/E) Ratio	Earnings per Share on Common Stock	on the relationship between market value of common stock and earnings
	Dividends on Common Stock	
Dividends per Share	Shares of Common Stock Outstanding	To indicate the extent to which earnings are being distributed to common stockholders
	Dividends per Share of Common Stock	To indicate the rate of return to common
Dividend Yield	Market Price per Share of Common Stock	stockholders in terms of dividends
	Market Frice per Share of Common Stock	and a state of a state

# Integrity, Objectivity, and Ethics in Business



#### **CHARACTERISTICS OF FINANCIAL STATEMENT FRAUD**

Each year the Association of Certified Fraud Examiners conducts a worldwide survey examining the characteristics of corporate fraud. The most recent study found that:

- 43.3% of frauds were detected by a tip from an employee or someone close to the company;
- Frauds committed by owners and executives tended to be much larger than those caused by employees;
- Most people who are caught committing fraud are first time offenders with clean employment histories; and
- In 81% of the cases, the person committing the fraud displayed one or more behavioral red flags such as living beyond their means, financial difficulties, and excessive control issues.

Fraud examiners can use these trends to help them narrow their focus when searching for fraud.

Source: 2012 Report to the Nations, Association of Certified Fraud Examiners, 2012.

# **Corporate Annual Reports**

Public corporations issue annual reports summarizing their operating activities for the past year and plans for the future. Such annual reports include the financial statements and the accompanying notes. In addition, annual reports normally include the following sections:

- Management discussion and analysis
- Report on internal control
- Report on fairness of the financial statements





## **Management Discussion and Analysis**

Management's Discussion and Analysis (MD&A) is required in annual reports filed with the Securities and Exchange Commission. It includes management's analysis of current operations and its plans for the future. Typical items included in the MD&A are as follows:

- Management's analysis and explanations of any significant changes between the current and prior years' financial statements.
- Important accounting principles or policies that could affect interpretation of the financial statements, including the effect of changes in accounting principles or the adoption of new accounting principles.
- Management's assessment of the company's liquidity and the availability of capital to the company.
- Significant risk exposures that might affect the company.
- Any "off-balance-sheet" arrangements such as leases not included directly in the financial statements. Such arrangements are discussed in advanced accounting courses and textbooks.

# Report on Internal Control

The Sarbanes-Oxley Act of 2002 requires a report on internal control by management. The report states management's responsibility for establishing and maintaining internal control. In addition, management's assessment of the effectiveness of internal controls over financial reporting is included in the report.

Sarbanes-Oxley also requires a public accounting firm to verify management's conclusions on internal control. Thus, two reports on internal control, one by management and one by a public accounting firm, are included in the annual report. In some situations, these may be combined into a single report on internal control.

# **Report on Fairness of the Financial Statements**

All publicly held corporations are required to have an independent audit (examination) of their financial statements. The Certified Public Accounting (CPA) firm that conducts the audit renders an opinion, called the *Report of Independent Registered Public Accounting Firm*, on the fairness of the statements.

An opinion stating that the financial statements present fairly the financial position, results of operations, and cash flows of the company is said to be an *unqualified opinion*, sometimes called a *clean opinion*. Any report other than an unqualified opinion raises a "red flag" for financial statement users and requires further investigation as to its cause.

The annual report of Nike Inc. is shown in Appendix B. The Nike report includes the financial statements as well as the MD&A Report on Internal Control and the Report on Fairness of the Financial Statements.

# Integrity, Objectivity, and Ethics in Business



#### **BUY LOW, SELL HIGH**

Research analysts work for banks, brokerages, or other financial institutions. Their job is to estimate the value of a company's common stock by reviewing and evaluating the company's business model, strategic plan, and financial performance. Based on this analysis, the analyst develops an estimate of a stock's value, which is called its *fundamental value*. Analysts then advise their clients to "buy" or "sell" a company's stock based on the following guidelines:

Current market price is greater than fundamental value Sell Current market price is lower than fundamental value Buy

If analysts are doing their job well, their clients will enjoy large returns by buying stocks at low prices and selling them at high prices.

# A P P E N D I X

# **Unusual Items on the Income Statement**

Generally accepted accounting principles require that unusual items be reported separately on the income statement. This is because such items do not occur frequently and are typically unrelated to current operations. Without separate reporting of these items, users of the financial statements might be misled about current and future operations.

Unusual items on the income statement are classified as one of the following:

- Affecting the *current period* income statement
- Affecting a prior period income statement

# Unusual Items Affecting the Current Period's Income Statement

Unusual items affecting the current period's income statement include the following:

- Discontinued operations
- Extraordinary items

These items are reported separately on the income statement for any period in which they occur.

**Discontinued Operations** A company may discontinue a component of its operations by selling or abandoning the component's operations. For example, a retailer might decide to sell its product only online and, thus, discontinue selling its merchandise at its retail outlets (stores).

If the discontinued component is (1) the result of a strategic shift and (2) has a major effect on the entity's operations and financial results, any gain or loss on discontinued operations is reported on the income statement as a *Gain (or loss) from discontinued operations*. It is reported immediately following *Income from continuing operations*.

To illustrate, assume that Jones Corporation produces and sells electrical products, hardware supplies, and lawn equipment. Because of a lack of profits, Jones discontinues its electrical products operation and sells the remaining inventory and other assets at a loss of \$100,000. Exhibit 11 illustrates the reporting of the loss on discontinued operations.³

Jones Corporation Income Statement For the Year Ended December 31, 2016	
Sales	\$12,350,000
Cost of merchandise sold	5,800,000
Gross profit	\$ 6,550,000
Selling and administrative expenses	5,240,000
Income from continuing operations before income tax	\$ 1,310,000
Income tax expense	620,000
Income from continuing operations	\$ 690,000
Loss on discontinued operations	100,000
Income before extraordinary items	\$ 590,000
Extraordinary items:	
Gain on condemnation of land	150,000
Net income	\$ 740,000

EXHIBIT 11

Unusual Items in the Income Statement

In addition, a note to the financial statements should describe the operations sold, including the date operations were discontinued, and details about the assets, liabilities, income, and expenses of the discontinued component.

**Extraordinary Items** An **extraordinary item** is defined as an event or a transaction that has both of the following characteristics:

- Unusual in nature
- Infrequent in occurrence

Gains and losses from natural disasters such as floods, earthquakes, and fires are normally reported as extraordinary items, provided that they occur infrequently. Gains or losses from land or buildings taken (condemned) for public use are also reported as extraordinary items.

Any gain or loss from extraordinary items is reported on the income statement as *Gain (or loss) from extraordinary item*. It is reported immediately following *Income from continuing operations* and any *Gain (or loss) on discontinued operations*.

To illustrate, assume that land owned by Jones Corporation was taken for public use (condemned) by the local government. The condemnation of the land resulted in a gain of \$150,000. Exhibit 11 illustrates the reporting of the extraordinary gain.^{4,5}

³ The gain or loss on discontinued operations is reported net of any tax effects. To simplify, the tax effects are not specifically identified in Exhibit 11.

⁴The gain or loss on extraordinary operations is reported net of any tax effects.

⁵ At the time of this writing, the Financial Accounting Standards Board had released an exposure draft, which proposes eliminating extraordinary items as a separate line item on the income statement. The outcome of this proposal was uncertain at the time of this writing.

**Reporting Earnings per Share** Earnings per common share should be reported separately for discontinued operations and extraordinary items. To illustrate, a partial income statement for Jones Corporation is shown in Exhibit 12. The company has 200,000 shares of common stock outstanding.

Exhibit 12 reports earnings per common share for income from continuing operations, discontinued operations, and extraordinary items. However, only earnings per share for income from continuing operations and net income are required by generally accepted accounting principles. The other per-share amounts may be presented in the notes to the financial statements.

## **EXHIBIT 12**

Income Statement with Earnings per Share

Jones Corporation Income Statement For the Year Ended December 31, 2016	
Earnings per common share: Income from continuing operations. Loss on discontinued operations Income before extraordinary items Extraordinary items:	\$3.45 0.50 \$2.95
Gain on condemnation of land	0.75 \$3.70

# Unusual Items Affecting the Prior Period's Income Statement

An unusual item may occur that affects a prior period's income statement. Two such items are as follows:

- · Errors in applying generally accepted accounting principles
- Changes from one generally accepted accounting principle to another

If an error is discovered in a prior period's financial statement, the prior-period statement and all following statements are restated and thus corrected.

A company may change from one generally accepted accounting principle to another. In this case, the prior-period financial statements are restated as if the new accounting principle had always been used.⁶

For both of the preceding items, the current-period earnings are not affected. That is, only the earnings reported in prior periods are restated. However, because the prior earnings are restated, the beginning balance of Retained Earnings may also have to be restated. This, in turn, may cause the restatement of other balance sheet accounts. Illustrations of these types of adjustments and restatements are provided in advanced accounting courses.

⁶ Changes from one acceptable depreciation method to another acceptable depreciation method are an exception to this general rule and are to be treated prospectively as a change in estimate, as discussed in Chapter 9.

# At a Glance 15



### Describe basic financial statement analytical methods.

**Key Points** The basic financial statements provide much of the information users need to make economic decisions. Analytical procedures are used to compare items on a current financial statement with related items on earlier statements, or to examine relationships within a financial statement.

Learning Outcomes	Example Exercises	Practice Exercises	
• Prepare a vertical analysis from a company's financial statements.	EE15-1	PE15-1A, 15-1B	
<ul> <li>Prepare a horizontal analysis from a company's financial statements.</li> </ul>	EE15-2	PE15-2A, 15-2B	
• Prepare common-sized financial statements.			



### Use financial statement analysis to assess the solvency of a business.

**Key Points** All users of financial statements are interested in the ability of a business to convert assets into cash (liquidity), pay its debts (solvency), and earn income (profitability). Liquidity, solvency, and profitability are interrelated. Liquidity and solvency are normally assessed by examining the following: current position analysis, accounts receivable analysis, inventory analysis, the ratio of fixed assets to long-term liabilities, the ratio of liabilities to stockholders' equity, and the number of times interest charges are earned.

Learning Outcomes	Example Exercises	Practice Exercises
Determine working capital.		
• Compute and interpret the current ratio.	EE15-3	PE15-3A, 15-3B
• Compute and interpret the quick ratio.	EE15-3	PE15-3A, 15-3B
• Compute and interpret accounts receivable turnover.	EE15-4	PE15-4A, 15-4B
• Compute and interpret the number of days' sales in receivables.	EE15-4	PE15-4A, 15-4B
• Compute and interpret inventory turnover.	EE15-5	PE15-5A, 15-5B
• Compute and interpret the number of days' sales in inventory.	EE15-5	PE15-5A, 15-5B
• Compute and interpret the ratio of fixed assets to long-term liabilities.	EE15-6	PE15-6A, 15-6B
• Compute and interpret the ratio of liabilities to stockholders' equity.	EE15-6	PE15-6A, 15-6B
• Compute and interpret the number of times interest charges are earned.	EE15-7	PE15-7A, 15-7B



### Use financial statement analysis to assess the profitability of a business.

**Key Points** Profitability analysis focuses on the ability of a company to earn profits. This ability is reflected in the company's operating results as reported on the income statement and resources available as reported on the balance sheet. Major analyses include the ratio of sales to assets, the rate earned on total assets, the rate earned on stockholders' equity, the rate earned on common stockholders' equity, earnings per share on common stock, the price-earnings ratio, dividends per share, and dividend yield.

Learning Outcomes	Example Exercises	Practice Exercises
• Compute and interpret the ratio of sales to assets.	EE15-8	PE15-8A, 15-8B
• Compute and interpret the rate earned on total assets.	EE15-9	PE15-9A, 15-9B
• Compute and interpret the rate earned on stockholders' equity.	EE15-10	PE15-10A, 15-10B
<ul> <li>Compute and interpret the rate earned on common stockholders' equity.</li> </ul>	EE15-10	PE15-10A, 15-10B
• Compute and interpret the earnings per share on common stock.	EE15-11	PE15-11A, 15-11B
• Compute and interpret the price-earnings ratio.	EE15-11	PE15-11A, 15-11B
• Compute and interpret the dividends per share and dividend yield.		
• Describe the uses and limitations of analytical measures.		



### Describe the contents of corporate annual reports.

**Key Points** Corporations normally issue annual reports to their stockholders and other interested parties. Such reports summarize the corporation's operating activities for the past year and plans for the future.

Learning Outcome	Example Exercises	Practice Exercises
• Describe the elements of a corporate annual report.		

### **Key Terms**

accounts receivable
analysis (706)
accounts receivable turnover (706)
common-sized statement (702)
current position analysis (704)
current ratio (704)
dividend yield (717)
dividends per share (716)
earnings per share (EPS)
on common stock (715)
extraordinary item (721)
horizontal analysis (698)
inventory analysis (708)
inventory turnover (708)

liquidity (703)

Management's Discussion and Analysis (MD&A) (719)

number of days' sales in inventory (708)

number of days' sales in receivables (707)

number of times interest charges are earned (710)

price-earnings (P/E) ratio (716)

profitability (703)

quick assets (705)

quick ratio (705)

leverage (713)

rate earned on common stockholders' equity (713) rate earned on stockholders' equity (713) rate earned on total assets (712) ratio of fixed assets to long-term liabilities (709) ratio of liabilities to stockholders' equity (709) ratio of sales to assets (711) solvency (703) vertical analysis (701) working capital (704)

### **Illustrative Problem**

Rainbow Paint Co.'s comparative financial statements for the years ending December 31, 2016 and 2015, are as follows. The market price of Rainbow Paint Co.'s common stock was \$25 on December 31, 2016, and \$30 on December 31, 2015.

Rainbow Paint Co. Comparative Income Statement For the Years Ended December 31, 2016 and 2015			
	2016	2015	
Sales	\$5,000,000	\$3,200,000	
Cost of goods sold	3,400,000	2,080,000	
Gross profit	\$1,600,000	\$1,120,000	
Selling expenses	\$ 650,000	\$ 464,000	
Administrative expenses	325,000	224,000	
Total operating expenses	\$ 975,000	\$ 688,000	
Income from operations	\$ 625,000	\$ 432,000	
Other income	25,000	19,200	
	\$ 650,000	\$ 451,200	
Other expense (interest)	105,000	64,000	
Income before income tax	\$ 545,000	\$ 387,200	
Income tax expense	300,000	176,000	
Net income	\$ 245,000	\$ 211,200	

Rainbow Paint Co. Comparative Retained Earnings Statement For the Years Ended December 31, 2016 and 2015				
	2016	2015		
Retained earnings, January 1	\$723,000	\$581,800		
Add net income for year	245,000	211,200		
Total \$968,000 \$793,000				
Deduct dividends:				
On preferred stock	\$ 40,000	\$ 40,000		
On common stock	45,000	30,000		
Total	\$ 85,000	\$ 70,000		
Retained earnings, December 31	\$883,000	\$723,000		

Rainbow Paint Co. Comparative Balance Sheet December 31, 2016 and 2015		
	Dec. 31, 2016	Dec. 31, 2015
Assets		
Current assets:		
Cash	\$ 175,000	\$ 125,000
Temporary investments	150,000	50,000
Accounts receivable (net)	425,000	325,000
Inventories	720,000	480,000
Prepaid expenses	30,000	20,000
Total current assets	\$1,500,000	\$1,000,000
Long-term investments	250,000	225,000
Property, plant, and equipment (net)	2,093,000	1,948,000
Total assets	\$3,843,000	\$3,173,000
Liabilities		
Current liabilities	\$ 750,000	\$ 650,000
Mortgage note payable, 10%, due 2017	\$ 410,000	_
Bonds payable, 8%, due 2020	800,000	\$ 800,000
Total long-term liabilities	\$1,210,000	\$ 800,000
Total liabilities	\$1,960,000	\$1,450,000
Stockholders' Equity		
Preferred 8% stock, \$100 par	\$ 500,000	\$ 500,000
Common stock, \$10 par	500,000	500,000
Retained earnings	883,000	723,000
Total stockholders' equity	\$1,883,000	\$1,723,000
Total liabilities and stockholders' equity	\$3,843,000	\$3,173,000

### **Instructions**

Determine the following measures for 2016:

- 1. Working capital
- 2. Current ratio
- 3. Quick ratio
- 4. Accounts receivable turnover
- 5. Number of days' sales in receivables
- 6. Inventory turnover
- 7. Number of days' sales in inventory
- 8. Ratio of fixed assets to long-term liabilities
- 9. Ratio of liabilities to stockholders' equity
- 10. Number of times interest charges are earned
- 11. Number of times preferred dividends are earned
- 12. Ratio of sales to assets
- 13. Rate earned on total assets
- 14. Rate earned on stockholders' equity

- 15. Rate earned on common stockholders' equity
- 16. Earnings per share on common stock
- 17. Price-earnings ratio
- 18. Dividends per share
- 19. Dividend yield

### **Solution**

(Ratios are rounded to the nearest single digit after the decimal point.)

- 1. Working capital: \$750,000 \$1,500,000 - \$750,000
- 2. Current ratio: 2.0 \$1,500,000 ÷ \$750,000
- 3. Quick ratio: 1.0 \$750,000 ÷ \$750,000
- 4. Accounts receivable turnover: 13.3 \$5,000,000 ÷ [(\$425,000 + \$325,000) ÷ 2]
- 5. Number of days' sales in receivables: 27.4 days \$5,000,000 ÷ 365 days = \$13,699 \$375,000 ÷ \$13,699
- 6. Inventory turnover: 5.7 \$3,400,000 ÷ [(\$720,000 + \$480,000) ÷ 2]
- 7. Number of days' sales in inventory: 64.4 days \$3,400,000 ÷ 365 days = \$9,315 \$600,000 ÷ \$9,315
- 8. Ratio of fixed assets to long-term liabilities: 1.7  $\$2,093,000 \div \$1,210,000$
- 9. Ratio of liabilities to stockholders' equity: 1.0 \$1,960,000 ÷ \$1,883,000
- 10. Number of times interest charges are earned: 6.2 (\$545,000 + \$105,000) ÷ \$105,000
- 11. Number of times preferred dividends are earned: 6.1 \$245,000 ÷ \$40,000
- 12. Ratio of sales to assets: 1.5 \$5,000,000 ÷ [(\$3,593,000 + \$2,948,000) ÷ 2]
- 13. Rate earned on total assets: 10.0% (\$245,000 + \$105,000) ÷ [(\$3,843,000 + \$3,173,000) ÷ 2]
- 14. Rate earned on stockholders' equity: 13.6% \$245,000 ÷ [(\$1,883,000 + \$1,723,000) ÷ 2]
- 15. Rate earned on common stockholders' equity: 15.7% (\$245,000 \$40,000) ÷ [(\$1,383,000 + \$1,223,000) ÷ 2]
- 16. Earnings per share on common stock: \$4.10 (\$245,000 \$40,000) ÷ 50,000 shares
- 17. Price-earnings ratio: 6.1 \$25 ÷ \$4.10
- 18. Dividends per share: \$0.90 \$45,000 ÷ 50,000 shares
- 19. Dividend yield: 3.6% \$0.90 ÷ \$25

### **Discussion Questions**

- What is the difference between horizontal and vertical analysis of financial statements?
- 2. What is the advantage of using comparative statements for financial analysis rather than statements for a single date or period?
- 3. The current year's amount of net income (after income tax) is 25% larger than that of the preceding year. Does this indicate an improved operating performance? Discuss.
- 4. How would the current and quick ratios of a service business compare?
- 5. a. Why is it advantageous to have a high inventory turnover?
  - b. Is it possible to have a high inventory turnover and a high number of days' sales in inventory? Discuss.
- 6. What do the following data taken from a comparative balance sheet indicate about the company's ability to borrow additional funds on a long-term basis in the current year as compared to the preceding year?

	Current Year	Preceding Year
Fixed assets (net)	\$1,260,000	\$1,360,000
Total long-term liabilities	300,000	400,000

- 7. a. How does the rate earned on total assets differ from the rate earned on stockholders' equity?
  - b. Which ratio is normally higher? Explain.
- 8. **Kroger**, a grocery store, recently had a price-earnings ratio of 13.7, while the average price-earnings ratio in the grocery store industry was 22.5. What might explain this difference?
- 9. The dividend yield of **Suburban Propane** was 7.7% in a recent year, and the dividend yield of **Google** was 0% in the same year. What might explain the difference between these ratios?
- 10. Describe two reports provided by independent auditors in the annual report to shareholders.

### **Practice Exercises**

#### **EE 15-1** *p. 701*

### PE 15-1A Horizontal analysis

OBJ. 1

The comparative temporary investments and inventory balances of a company follow.



	Current Year	Previous Year
Temporary investments	\$59,280	\$52,000
Inventory	70,680	76,000

Based on this information, what is the amount and percentage of increase or decrease that would be shown in a balance sheet with horizontal analysis?

### **EE 15-1** p. 701

### **PE 15-1B** Horizontal analysis

OBJ. 1

The comparative accounts payable and long-term debt balances for a company follow.



	Current Year	Previous Year
Accounts payable	\$111,000	\$100,000
Long-term debt	132,680	124,000

Based on this information, what is the amount and percentage of increase or decrease that would be shown in a balance sheet with horizontal analysis?

### EE 15-2 p. 702 PE 15-2A Vertical analysis

OBJ. 1

Income statement information for Axiom Corporation follows:



 Sales
 \$725,000

 Cost of goods sold
 391,500

 Gross profit
 333,500

Prepare a vertical analysis of the income statement for Axiom Corporation.

### **EE 15-2** *p. 702* **PE 15-2B** Vertical analysis

OBJ. 1

Income statement information for Einsworth Corporation follows:



 Sales
 \$1,200,000

 Cost of goods sold
 780,000

 Gross profit
 420,000

Prepare a vertical analysis of the income statement for Einsworth Corporation.

### EE 15-3 p. 706 PE 15-3A Current position analysis

OBJ. 2

The following items are reported on a company's balance sheet:



Cash \$160,000

Marketable securities 75,000

Accounts receivable (net) 65,000

Inventory 140,000

Accounts payable 200,000

Determine (a) the current ratio and (b) the quick ratio. Round to one decimal place.

### **EE 15-3** *p. 706* **PE 15-3B** Current position analysis

OBJ. 2

The following items are reported on a company's balance sheet:



Cash \$210,000
Marketable securities 120,000
Accounts receivable (net) 110,000
Inventory 160,000
Accounts payable 200,000

Determine (a) the current ratio and (b) the quick ratio. Round to one decimal place.

### EE 15-4 p. 707 PE 15-4A Accounts receivable analysis

OBJ. 2

A company reports the following:



Sales \$832,000 Average accounts receivable (net) 80,000

Determine (a) the accounts receivable turnover and (b) the number of days' sales in receivables. Round to one decimal place.

### EE 15-4 p. 707 PE 15-4B Accounts receivable analysis

OBJ. 2

A company reports the following:



Sales \$3,150,000 Average accounts receivable (net) 210,000

Determine (a) the accounts receivable turnover and (b) the number of days' sales in receivables. Round to one decimal place.

#### **EE 15-5** *p. 709* PE 15-5A Inventory analysis

OBJ. 2

A company reports the following:



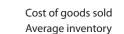
Cost of goods sold \$630,000 Average inventory 90,000

Determine (a) the inventory turnover and (b) the number of days' sales in inventory. Round to one decimal place.

#### PE 15-5B Inventory analysis **EE 15-5** *p. 709*

OBJ. 2





\$435,000 72,500

Determine (a) the inventory turnover and (b) the number of days' sales in inventory. Round to one decimal place.

#### PE 15-6A Long-term solvency analysis **EE 15-6** p. 710

OBJ. 2

The following information was taken from Kellman Company's balance sheet:



ME HOW

Fixed assets (net) \$2,000,000 Long-term liabilities 800,000 Total liabilities 1,000,000 Total stockholders' equity 625,000

Determine the company's (a) ratio of fixed assets to long-term liabilities and (b) ratio of liabilities to stockholders' equity.

#### PE 15-6B Long-term solvency analysis **EE 15-6** *p. 710*

OBJ. 2

The following information was taken from Charu Company's balance sheet:



ME HOW

ME HOW

Fixed assets (net) \$860,000 200,000 Long-term liabilities Total liabilities 600,000 Total stockholders' equity 250,000

Determine the company's (a) ratio of fixed assets to long-term liabilities and (b) ratio of liabilities to stockholders' equity.

#### PE 15-7A Times interest charges are earned **EE 15-7** p. 711

OBJ. 2

A company reports the following:

Income before income tax

\$4,000,000

Determine the number of times interest charges are earned.

Interest expense

#### **EE15-7** p. 711 PE 15-7B Times interest charges are earned

OBJ. 2

A company reports the following:

Income before income tax

\$8,000,000 500,000

Determine the number of times interest charges are earned.

Interest expense

#### **EE 15-8** *p. 712* PE 15-8A Sales to assets

OBJ. 3

A company reports the following:



\$1,800,000 1,125,000

Determine the ratio of sales to assets.



### **EE 15-8** *p. 712* **PE 15-8B** Sales to assets

OBJ. 3

A company reports the following:



Sales \$4,400,000
Average total assets (excluding long-term investments) 2,000,000

Determine the ratio of sales to assets.

### EE 15-9 p. 713 PE 15-9A Rate earned on total assets

OBJ. 3

A company reports the following income statement and balance sheet information for the current year:



Net income\$ 250,000Interest expense100,000Average total assets2,500,000

Determine the rate earned on total assets.

### EE 15-9 p. 713 PE 15-9B Rate earned on total assets

OBJ. 3

A company reports the following income statement and balance sheet information for the current year:



Net income \$ 410,000 Interest expense 90,000 Average total assets 5,000,000

Determine the rate earned on total assets.

### EE 15-10 p.715 PE 15-10A Common stockholders' profitability analysis

OBJ. 3

A company reports the following:



Net income \$ 375,000
Preferred dividends 75,000
Average stockholders' equity 2,500,000
Average common stockholders' equity 1,875,000

Determine (a) the rate earned on stockholders' equity and (b) the rate earned on common stockholders' equity. Round to one decimal place.

### **EE 15-10** p. 715

### PE 15-10B Common stockholders' profitability analysis

OBJ. 3

A company reports the following:



Net income\$1,000,000Preferred dividends50,000Average stockholders' equity6,250,000Average common stockholders' equity3,800,000

Determine (a) the rate earned on stockholders' equity and (b) the rate earned on common stockholders' equity. Round to one decimal place.

### **EE 15-11** p. 716

### PE 15-11A Earnings per share and price-earnings ratio

OBJ. 3

A company reports the following:



Net income \$185,000
Preferred dividends \$25,000
Shares of common stock outstanding 100,000
Market price per share of common stock \$20

- a. Determine the company's earnings per share on common stock.
- b. Determine the company's price-earnings ratio.

#### **EE 15-11** *p. 716*

### PE 15-11B Earnings per share and price-earnings ratio

OBJ. 3



Net income \$410,000
Preferred dividends \$60,000
Shares of common stock outstanding 50,000
Market price per share of common stock \$84

- a. Determine the company's earnings per share on common stock.
- b. Determine the company's price-earnings ratio.

A company reports the following:

### Exercises

### EX 15-1 Vertical analysis of income statement

OBJ. 1

✓ a. Current year net income: \$175,000; 7.0% of sales



**Current Year Previous Year** Sales \$2,350,000 \$2,500,000 Cost of goods sold 1,500,000 1,292,500 Selling expenses 300,000 376,000 Administrative expenses 375,000 305,500 Income tax expense 150,000 141,000

Revenue and expense data for Gresham Inc. for two recent years are as follows:

- a. Prepare an income statement in comparative form, stating each item for both years as a percent of sales. Round to one decimal place.
- b. Comment on the significant changes disclosed by the comparative income statement.

### **EX 15-2** Vertical analysis of income statement

OBJ. 1

Previous Year

**v** a. Current fiscal year income from continuing operations, 13.0% of revenues

The following comparative income statement (in thousands of dollars) for the two recent fiscal years was adapted from the annual report of Speedway Motorsports, Inc., owner and operator of several major motor speedways, such as the Atlanta, Texas, and Las Vegas Motor Speedways.

### 34



Current rear	rievious ieai
\$116,034	\$130,239
151,562	163,621
192,662	185,394
29,902	26,951
\$490,160	\$506,205
\$101,402	\$106,204
122,950	120,146
18,908	20,352
183,215	241,223
\$426,475	\$487,925
\$ 63,685	\$ 18,280
	\$116,034 151,562 192,662 29,902 \$490,160 \$101,402 122,950 18,908 183,215 \$426,475

**Current Year** 

- a. Prepare a comparative income statement for these two years in vertical form, stating each item as a percent of revenues. Round to one decimal place.
- b. Comment on the significant changes.

✓ a. Tannenhill net income: \$120,000; 3.0% of sales



### EX 15-3 Common-sized income statement

OBJ. 1

Revenue and expense data for the current calendar year for Tannenhill Company and for the electronics industry are as follows. The Tannenhill Company data are expressed in dollars. The electronics industry averages are expressed in percentages.

	Tannenhill Company	Electronics Industry Average
Sales	\$4,000,000	100.0%
Cost of goods sold	_2,120,000	60.0
Gross profit	\$1,880,000	40.0%
Selling expenses	\$1,080,000	24.0%
Administrative expenses	640,000	14.0
Total operating expenses	\$1,720,000	38.0%
Operating income	\$ 160,000	2.0%
Other income	120,000	3.0
	\$ 280,000	5.0%
Other expense	80,000	2.0
Income before income tax	\$ 200,000	3.0%
Income tax expense	80,000	2.0
Net income	\$ 120,000	1.0%

- a. Prepare a common-sized income statement comparing the results of operations for Tannenhill Company with the industry average. Round to one decimal place.
- b. As far as the data permit, comment on significant relationships revealed by the comparisons.

### EX 15-4 Vertical analysis of balance sheet

OBJ. 1

Balance sheet data for Novak Company on December 31, the end of two recent fiscal years, follows:

	Current Year	<b>Previous Year</b>
Current assets	\$1,300,000	\$ 945,000
Property, plant, and equipment	3,000,000	3,150,000
Intangible assets	700,000	405,000
Current liabilities	1,000,000	720,000
Long-term liabilities	1,500,000	1,575,000
Common stock	500,000	495,000
Retained earnings	2,000,000	1,710,000

Prepare a comparative balance sheet for both years, stating each asset as a percent of total assets and each liability and stockholders' equity item as a percent of the total liabilities and stockholders' equity. Round to one decimal place.

### EX 15-5 Horizontal analysis of the income statement

OBJ. 1

Income statement data for Moreno Company for two recent years ended December 31, are as follows:

	Current Year	Previous Year
Sales	\$1,120,000	\$1,000,000
Cost of goods sold	971,250	875,000
Gross profit	\$ 148,750	\$ 125,000
Selling expenses	\$ 71,250	\$ 62,500
Administrative expenses	56,000	50,000
Total operating expenses	\$ 127,250	\$ 112,500
Income before income tax	\$ 21,500	\$ 12,500
Income tax expense	8,000	5,000
Net income	\$ 13,500	\$ 7,500

- a. Prepare a comparative income statement with horizontal analysis, indicating the increase (decrease) for the current year when compared with the previous year. Round to one decimal place.
- b. What conclusions can be drawn from the horizontal analysis?

✓ Retained earnings, Current year, 40.0%





✓ a. Net income increase, 80.0%





✓ a. Current year working capital, \$1,600,000



### **EX 15-6** Current position analysis

OBJ. 2

The following data were taken from the balance sheet of Gostkowski Company at the end of two recent fiscal years:

	Current Year	Previous Year
Cash	\$ 480,000	\$ 392,000
Marketable securities	576,000	411,600
Accounts and notes receivable (net)	384,000	316,400
Inventories	408,000	333,200
Prepaid expenses	552,000	506,800
Total current assets	\$2,400,000	\$1,960,000
Accounts and notes payable (short-term)	\$ 600,000	\$ 525,000
Accrued liabilities	200,000	175,000
Total current liabilities	\$ 800,000	\$ 700,000

- a. Determine for each year (1) the working capital, (2) the current ratio, and (3) the quick ratio. Round ratios to one decimal place.
- b. What conclusions can be drawn from these data as to the company's ability to meet its currently maturing debts?

### EX 15-7 Current position analysis

OBJ. 2

PepsiCo, Inc., the parent company of Frito-Lay snack foods and Pepsi beverages, had the following current assets and current liabilities at the end of two recent years:

	Current Year (in millions)	Previous Year (in millions)
Cash and cash equivalents	\$ 6,297	\$ 4,067
Short-term investments, at cost	322	358
Accounts and notes receivable, net	7,041	6,912
Inventories	3,581	3,827
Prepaid expenses and other current assets	1,479	2,277
Short-term obligations	4,815	6,205
Accounts payable	12,274	11,949

- a. Determine the (1) current ratio and (2) quick ratio for both years. Round to one decimal place.
- b. What conclusions can you draw from these data?

### **EX 15-8** Current position analysis

OBJ. 2

The bond indenture for the 10-year, 9% debenture bonds issued January 2, 2015, required working capital of \$100,000, a current ratio of 1.5, and a quick ratio of 1.0 at the end of each calendar year until the bonds mature. At December 31, 2016, the three measures were computed as follows:

1.	Current assets:		
	Cash	\$102,000	
	Temporary investments	48,000	
	Accounts and notes receivable (net)	120,000	
	Inventories	36,000	
	Prepaid expenses	24,000	
	Intangible assets	124,800	
	Property, plant, and equipment	55,200	
	Total current assets (net)		\$510,000
	Current liabilities:		
	Accounts and short-term notes payable	\$ 96,000	
	Accrued liabilities	204,000	
	Total current liabilities		300,000
	Working capital		\$210,000
2.	Current ratio	1.7	\$510,000 ÷ \$300,000
3.	Quick ratio	1.2	\$115,200 ÷ \$ 96,000

✓ a. (1) Current year's current ratio, 1.1



a. List the errors in the determination of the three measures of current position analysis.

The following data are taken from the financial statements of Krawcheck Inc. Terms of

### **EX 15-9** Accounts receivable analysis

all sales are 2/10, n/55.

OBJ. 2

✓ a. Accounts receivable turnover, 2016, 7.0



 2016
 2015
 2014

 Accounts receivable, end of year
 \$ 500,000
 \$ 475,000
 \$440,000

- Sales on account 3,412,500 2,836,500

  a. For 2015 and 2016, determine (1) the accounts receivable turnover and (2) the number of days' sales in receivables. Round to the nearest dollar and one decimal place.
- b. What conclusions can be drawn from these data concerning accounts receivable and credit policies?

### EX 15-10 Accounts receivable analysis

OBJ. 2

Xavier Stores Company and Lestrade Stores Inc. are large retail department stores. Both companies offer credit to their customers through their own credit card operations. Information from the financial statements for both companies for two recent years is as follows (all numbers are in millions):

	Xavier	Lestrade
Merchandise sales	\$8,500,000	\$4,585,000
Credit card receivables—beginning	820,000	600,000
Credit card receviables—ending	880,000	710,000

- a. Determine the (1) accounts receivable turnover and (2) the number of days' sales in receivables for both companies. Round to one decimal place.
- b. Compare the two companies with regard to their credit card policies.

### EX 15-11 Inventory analysis

OBJ. 2

✓ a. Inventory turnover, current year, 7.5



The following data were extracted from the income statement of Saleh Inc.:

	Current Year	Previous Year
Sales	\$12,750,000	\$13,284,000
Beginning inventories	840,000	800,000
Cost of goods sold	6,375,000	7,380,000
Ending inventories	860,000	840,000

- a. Determine for each year (1) the inventory turnover and (2) the number of days' sales in inventory. Round to the nearest dollar and one decimal place.
- b. What conclusions can be drawn from these data concerning the inventories?

### EX 15-12 Inventory analysis

OBJ. 2

Dell Inc. and Hewlett-Packard Company (HP) compete with each other in the personal computer market. Dell's primary strategy is to assemble computers to customer orders, rather than for inventory. Thus, for example, Dell will build and deliver a computer within four days of a customer entering an order on a Web page. Hewlett-Packard, on the other hand, builds some computers prior to receiving an order, then sells from this inventory once an order is received. Selected financial information for both companies from a recent year's financial statements follows (in millions):

	Dell Inc.	Hewlett-Packard Company
Sales	\$56,940	\$120,357
Cost of goods sold	44,754	92,385
Inventory, beginning of period	1,382	6,317
Inventory, end of period	1,404	7,490

(Continued)

✓ a. Dell inventory turnover, 32.1



- a. Determine for both companies (1) the inventory turnover and (2) the number of days' sales in inventory. Round to one decimal place.
- b. Interpret the inventory ratios by considering Dell's and Hewlett-Packard's operating strategies.

### EX 15-13 Ratio of liabilities to stockholders' equity and number of times interest OBJ. 2 charges are earned

✓ a. Ratio of liabilities to stockholders' equity, current year, 0.9

The following data were taken from the financial statements of Hunter Inc. for December 31 of two recent years:

	Current Year	Previous Year
Accounts payable	\$ 924,000	\$ 800,000
Current maturities of serial bonds payable	200,000	200,000
Serial bonds payable, 10%, issued 2009, due 2019	1,000,000	1,200,000
Common stock, \$10 par value	250,000	250,000
Paid-in capital in excess of par	1,250,000	1,250,000
Retained earnings	860,000	500,000

The income before income tax was \$480,000 and \$420,000 for the current and previous years, respectively.

- a. Determine the ratio of liabilities to stockholders' equity at the end of each year. Round to one decimal place.
- b. Determine the number of times the bond interest charges are earned during the year for both years. Round to one decimal place.
- c. What conclusions can be drawn from these data as to the company's ability to meet its currently maturing debts?

### EX 15-14 Ratio of liabilities to stockholders' equity and number of times interest OBJ. 2 charges are earned

**Hasbro** and **Mattel, Inc.**, are the two largest toy companies in North America. Condensed liabilities and stockholders' equity from a recent balance sheet are shown for each company as follows (in thousands):

	Hasbro	Mattel
Current liabilities	\$ 960,435	\$ 1,716,012
Long-term debt	1,396,421	1,100,000
Deferred liabilities	461,152	643,729
Total liabilities	\$2,818,008	\$ 3,459,741
Shareholders' equity:		
Common stock	\$ 104,847	\$ 441,369
Additional paid in capital	655,943	1,727,682
Retained earnings	3,354,545	3,515,181
Accumulated other comprehensive loss and other equity items	(72,307)	(464,486)
Treasury stock, at cost	(2,535,649)	(2,152,702)
Total stockholders' equity	\$1,507,379	\$ 3,067,044
Total liabilities and stockholders' equity	\$4,325,387	\$ 6,526,785

The income from operations and interest expense from the income statement for each company were as follows (in thousands):

	Hasbro	Mattel
Income from operations (before income tax)	\$453,402	\$945,045
Interest expense	117,403	88,835

- a. Determine the ratio of liabilities to stockholders' equity for both companies. Round to one decimal place.
- b. Determine the number of times interest charges are earned for both companies. Round to one decimal place.
- c. Interpret the ratio differences between the two companies.

✓ a. Hasbro, 1.9



OBJ. 2

### **EX 15-15** Ratio of liabilities to stockholders' equity and ratio of fixed assets to long-term liabilities

✓ a. Mondelez International, Inc., 1.3



Recent balance sheet information for two companies in the food industry, Mondelez International, Inc., and The Hershey Company, is as follows (in thousands of dollars):

	Mondelez	Hershey
Net property, plant, and equipment	\$10,010,000	\$1,674,071
Current liabilities	14,873,000	1,471,110
Long-term debt	15,574,000	1,530,967
Other long-term liabilities	12,816,000	716,013
Stockholders' equity	32,215,000	1,036,749

- a. Determine the ratio of liabilities to stockholders' equity for both companies. Round to one decimal place.
- b. Determine the ratio of fixed assets to long-term liabilities for both companies. Round to one decimal place.
- c. Interpret the ratio differences between the two companies.

### EX 15-16 Ratio of sales to assets

OBJ. 3

Three major segments of the transportation industry are motor carriers, such as YRC Worldwide; railroads, such as Union Pacific; and transportation arrangement services, such as C.H. Robinson Worldwide Inc. Recent financial statement information for these three companies is shown as follows (in thousands of dollars):

	YRC Worldwide	Union Pacific	C.H. Robinson Worldwide Inc.
Sales	\$4,334,640	\$16,965,000	\$9,274,305
Average total assets	2,812,504	42,636,000	1,914,974

- a. Determine the ratio of sales to assets for all three companies. Round to one decimal place.
- b. Assume that the ratio of sales to assets for each company represents their respective industry segment. Interpret the differences in the ratio of sales to assets in terms of the operating characteristics of each of the respective segments.

### **EX 15-17** Profitability ratios

OBJ. 3

The following selected data were taken from the financial statements of Robinson Inc. for December 31, 2016, 2015 and 2014:

	December 31		
	2016	2015	2014
Total assets	\$4,800,000	\$4,400,000	\$4,000,000
Notes payable (8% interest)	2,250,000	2,250,000	2,250,000
Common stock	250,000	250,000	250,000
Preferred 4% stock, \$100 par			
(no change during year)	500,000	500,000	500,000
Retained earnings	1,574,000	1,222,000	750,000

The 2016 net income was \$372,000, and the 2015 net income was \$492,000. No dividends on common stock were declared between 2014 and 2016.

- a. Determine the rate earned on total assets, the rate earned on stockholders' equity, and the rate earned on common stockholders' equity for the years 2015 and 2016. Round to one decimal place.
- b. What conclusions can be drawn from these data as to the company's profitability?

✓ a. YRC Worldwide, 1.5



✓ a. Rate earned on total assets, 2016, 12.0%



### **EX 15-18** Profitability ratios

OBJ. 3

✓a. Year 3 rate earned on total assets, 12.2%



Ralph Lauren Corp. sells men's apparel through company-owned retail stores. Recent financial information for Ralph Lauren follows (all numbers in thousands):

	Fiscal Year 3	Fiscal Year 2	
Net income	\$567,600	\$479,500	
Interest expense	18,300	22,200	
	Fiscal Year 3	Fiscal Year 2	Fiscal Year 1
Total assets (at end of fiscal year)	\$4,981,100	\$4,648,900	\$4,356,500
Total stockholders' equity (at end of fiscal year)	3,304,700	3,116,600	2,735,100

Assume the apparel industry average rate earned on total assets is 8.0%, and the average rate earned on stockholders' equity is 10.0% for the year ended April 2, Year 3.

- a. Determine the rate earned on total assets for Ralph Lauren for fiscal Years 2 and 3. Round to one digit after the decimal place.
- b. Determine the rate earned on stockholders' equity for Ralph Lauren for fiscal Years 2 and 3. Round to one decimal place.
- c. Evaluate the two-year trend for the profitability ratios determined in (a) and (b).
- d. Evaluate Ralph Lauren's profit performance relative to the industry.

### EX 15-19 Six measures of solvency or profitability

**OBJ. 2, 3** 

The following data were taken from the financial statements of Gates Inc. for the current fiscal year. Assuming that long-term investments totaled \$3,000,000 throughout the year and that total assets were \$7,000,000 at the beginning of the current fiscal year, determine the following: (a) ratio of fixed assets to long-term liabilities, (b) ratio of liabilities to stockholders' equity, (c) ratio of sales to assets, (d) rate earned on total assets, (e) rate earned on stockholders' equity, and (f) rate earned on common stockholders' equity. Round to one decimal place.

Property, plant, and equipment (net)			\$ 3,200,000
Liabilities:			
Current liabilities		\$1,000,000	
Mortgage note payable, 6%, issued 2005, due 2021		2,000,000	
Total liabilities			\$ 3,000,000
Stockholders' equity:			
Preferred \$10 stock, \$100 par (no change during year)			\$ 1,000,000
Common stock, \$10 par (no change during year)			2,000,000
Retained earnings:			
Balance, beginning of year	\$1,570,000		
Net income	930,000	\$2,500,000	
Preferred dividends	\$ 100,000		
Common dividends	400,000	500,000	
Balance, end of year			2,000,000
Total stockholders' equity			\$ 5,000,000
Sales			\$18,900,000
Interest expense			\$ 120,000

### EX 15-20 Six measures of solvency or profitability

OBJ. 2, 3

The balance sheet for Garcon Inc. at the end of the current fiscal year indicated the following:

Bonds payable, 8% (issued in 2006, due in 2026)	\$5,000,000
Preferred \$4 stock, \$50 par	2,500,000
Common stock, \$10 par	5,000,000

✓ c. Ratio of sales to assets, 4.2

✓ d. Price-earnings ratio, 10.0

Income before income tax was \$3,000,000, and income taxes were \$1,200,000 for the current year. Cash dividends paid on common stock during the current year totaled \$1,200,000. The common stock was selling for \$32 per share at the end of the year. Determine each of the following: (a) number of times bond interest charges are earned, (b) number of times preferred dividends are earned, (c) earnings per share on common stock, (d) price-earnings ratio, (e) dividends per share of common stock, and (f) dividend yield. Round to one decimal place, except earnings per share, which should be rounded to two decimal places.

### EX 15-21 Earnings per share, price-earnings ratio, dividend yield

OBJ. 3

The following information was taken from the financial statements of Tolbert Inc. for December 31 of the current fiscal year:

Common stock, \$20 par (no change during the year) \$10,000,000 Preferred \$4 stock, \$40 par (no change during the year) 2,500,000

The net income was \$1,750,000 and the declared dividends on the common stock were \$1,125,000 for the current year. The market price of the common stock is \$45 per share. For the common stock, determine (a) the earnings per share, (b) the price-earnings ratio, (c) the dividends per share, and (d) the dividend yield. Round to one decimal place, except earnings per share, which should be rounded to two decimal places.

### EX 15-22 Price-earnings ratio; dividend yield

OBJ. 3

The table that follows shows the stock price, earnings per share, and dividends per share for three companies for a recent year:

	Price	Earnings per Share	Dividends per Share
Deere & Co.	\$ 86.20	\$ 8.71	\$2.04
Google	873.32	36.75	0.00
The Coca-Cola Company	39.79	1.97	1.02

- a. Determine the price-earnings ratio and dividend yield for the three companies. Round to one decimal place.
- b. Explain the differences in these ratios across the three companies.

### **Appendix**

### EX 15-23 Earnings per share, extraordinary item

✓ b. Earnings per share on common stock, \$7.60 The net income reported on the income statement of Cutler Co. was \$4,000,000. There were 500,000 shares of \$10 par common stock and 100,000 shares of \$2 preferred stock outstanding throughout the current year. The income statement included two extraordinary items: an \$800,000 gain from condemnation of land and a \$400,000 loss arising from flood damage, both after applicable income tax. Determine the per-share figures for common stock for (a) income before extraordinary items and (b) net income.

### **Appendix**

### EX 15-24 Extraordinary item

Assume that the amount of each of the following items is material to the financial statements. Classify each item as either normally recurring (NR) or extraordinary (E).

- a. Loss on the disposal of equipment considered to be obsolete because of the development of new technology.
- b. Uninsured loss on building due to hurricane damage. The building was purchased by the company in 1910 and had not previously incurred hurricane damage.
- c. Gain on sale of land condemned by the local government for a public works project.
- d. Uninsured flood loss. (Flood insurance is unavailable because of periodic flooding in the area.)
- e. Interest revenue on notes receivable.
- f. Uncollectible accounts expense.
- g. Loss on sale of investments in stocks and bonds.



✓ b. Price-earnings

ratio, 15.0

ME HOW

### **Appendix**

### **EX 15-25** Income statement and earnings per share for extraordinary items and discontinued operations

Apex Inc. reports the following for a recent year:

Income from continuing operations before income tax	\$1,000,000
Extraordinary property loss from hurricane	\$140,000*
Loss from discontinued operations	\$240,000*
Weighted average number of shares outstanding	20,000
Applicable tax rate	40%
*Net of any tax effect.	

- a. Prepare a partial income statement for Apex Inc., beginning with income from continuing operations before income tax.
- b. Calculate the earnings per common share for Apex Inc., including per-share amounts for unusual items.

### **Appendix**

### EX 15-26 Unusual items

Discuss whether Colston Company correctly reported the following items in the financial statements:

- a. In a recent year, the company discovered a clerical error in the prior year's accounting records. As a result, the reported net income for the previous year was overstated by \$45,000. The company corrected this error by restating the prior-year financial statements.
- b. In a recent year, the company voluntarily changed its method of accounting for long-term construction contracts from the percentage of completion method to the completed contract method. Both methods are acceptable under generally acceptable accounting principles. The cumulative effect of this change was reported as a separate component of income in the current period income statement.

### **Problems: Series A**

#### PR 15-1A Horizontal analysis of income statement

OBJ. 1

For 2016, Clapton Company reported a decline in net income. At the end of the year, S. Hand, the president, is presented with the following condensed comparative income statement:

### ✓ 1. Sales, 12.5% increase



#### General Ledger



### Clapton Company Comparative Income Statement For the Years Ended December 31, 2016 and 2015

2016	2015
\$6,750,000	\$6,000,000
2,480,000	2,000,000
\$4,270,000	\$4,000,000
\$1,260,000	\$1,000,000
625,000	500,000
\$1,885,000	\$1,500,000
\$2,385,000	\$2,500,000
110,000	100,000
\$2,495,000	\$2,600,000
60,000	50,000
\$2,435,000	\$2,550,000
	\$6,750,000 2,480,000 \$4,270,000 \$1,260,000 625,000 \$1,885,000 \$2,385,000 110,000 \$2,495,000

### **Instructions**

- 1. Prepare a comparative income statement with horizontal analysis for the two-year period, using 2015 as the base year. Round to one decimal place.
- 2. To the extent the data permit, comment on the significant relationships revealed by the horizontal analysis prepared in (1).

### PR 15-2A Vertical analysis of income statement

**OBJ. 1** 

For 2016, Indigo Company initiated a sales promotion campaign that included the expenditure of an additional \$39,000 for advertising. At the end of the year, Lumi Neer, the president, is presented with the following condensed comparative income statement:

✓ 1. Net income, 2016,

13.0%

#### Indigo Company Comparative Income Statement For the Years Ended December 31, 2016 and 2015

	2016	2015
Sales	\$820,000	\$600,000
Cost of goods sold	311,600	240,000
Gross profit	\$508,400	\$360,000
Selling expenses	\$164,000	\$108,000
Administrative expenses	57,400	54,000
Total operating expenses	\$221,400	\$162,000
Income from operations	\$287,000	\$198,000
Other income	65,600	48,000
Income before income tax	\$352,600	\$246,000
Income tax expense	246,000	180,000
Net income	\$106,600	\$ 66,000

#### **Instructions**

- 1. Prepare a comparative income statement for the two-year period, presenting an analysis of each item in relationship to sales for each of the years. Round to one decimal place.
- 2. To the extent the data permit, comment on the significant relationships revealed by the vertical analysis prepared in (1).

### PR 15-3A Effect of transactions on current position analysis

OBJ. 2

Data pertaining to the current position of Forte Company are as follows:

<u> </u>	•
Cash	\$412,500
Marketable securities	187,500
Accounts and notes receivable (net)	300,000
Inventories	700,000
Prepaid expenses	50,000
Accounts payable	200,000
Notes payable (short-term)	250,000
Accrued expenses	300,000

### Instructions

1. Compute (a) the working capital, (b) the current ratio, and (c) the quick ratio. Round to one decimal place.

(Continued)

✓ 2. c. Current ratio, 2.0



2. List the following captions on a sheet of paper:

Transaction	Working Capital	Current Ratio	Quick Ratio

Compute the working capital, the current ratio, and the quick ratio after each of the following transactions, and record the results in the appropriate columns. *Consider each transaction separately* and assume that only that transaction affects the data given. Round to one decimal place.

- a. Sold marketable securities at no gain or loss, \$70,000.
- b. Paid accounts payable, \$125,000.
- c. Purchased goods on account, \$110,000.
- d. Paid notes payable, \$100,000.
- e. Declared a cash dividend, \$150,000.
- f. Declared a common stock dividend on common stock, \$50,000.
- g. Borrowed cash from bank on a long-term note, \$225,000.
- h. Received cash on account, \$125,000.
- i. Issued additional shares of stock for cash, \$600,000.
- j. Paid cash for prepaid expenses, \$10,000.

### PR 15-4A Nineteen measures of solvency and profitability

OBJ. 2, 3

The comparative financial statements of Bettancort Inc. are as follows. The market price of Bettancort Inc. common stock was \$71.25 on December 31, 2016.

### ✓ 5. Number of days' sales in receivables, 36.5



### Bettancort Inc. Comparative Retained Earnings Statement For the Years Ended December 31, 2016 and 2015

	2016	2015
Retained earnings, January 1	\$2,655,000	\$2,400,000
Add net income for year	300,000	280,000
Total Deduct dividends:	\$2,955,000	\$2,680,000
On preferred stock	\$ 15,000	\$ 15,000
On common stock	10,000	10,000
Total	\$ 25,000	\$ 25,000
Retained earnings, December 31	\$2,930,000	\$2,655,000

### Bettancort Inc. Comparative Income Statement For the Years Ended December 31, 2016 and 2015

	2016	2015
Sales	\$1,200,000	\$1,000,000
Cost of goods sold	500,000	475,000
Gross profit	\$ 700,000	\$ 525,000
Selling expenses	\$ 240,000	\$ 200,000
Administrative expenses	180,000	150,000
Total operating expenses	\$ 420,000	\$ 350,000
Income from operations	\$ 280,000	\$ 175,000
Other income	166,000	225,000
	\$ 446,000	\$ 400,000
Other expense (interest)	66,000	60,000
Income before income tax	\$ 380,000	\$ 340,000
Income tax expense	80,000	60,000
Net income	\$ 300,000	\$ 280,000

#### Bettancort Inc. Comparative Balance Sheet December 31, 2016 and 2015

	Dec. 31, 2016	Dec. 31, 2015
Assets		
Current assets:		
Cash	\$ 450,000	\$ 400,000
Marketable securities	300,000	260,000
Accounts receivable (net)	130,000	110,000
Inventories	67,000	58,000
Prepaid expenses	153,000	139,000
Total current assets	\$1,100,000	\$ 967,000
Long-term investments	2,350,000	2,200,000
Property, plant, and equipment (net)	1,320,000	1,188,000
Total assets	\$4,770,000	\$4,355,000
Liabilities		
Current liabilities	\$ 440,000	\$ 400,000
Long-term liabilities:		
Mortgage note payable, 8%, due 2021	\$ 100,000	\$ 0
Bonds payable, 5%, due 2017	1,000,000	1,000,000
Total long-term liabilities	\$1,100,000	\$1,000,000
Total liabilities	\$1,540,000	\$1,400,000
Stockholders' Equity	<del></del>	
Preferred \$0.75 stock, \$10 par	\$ 200,000	\$ 200,000
Common stock, \$10 par	100,000	100,000
Retained earnings	2,930,000	2,655,000
Total stockholders' equity	\$3,230,000	\$2,955,000
Total liabilities and stockholders' equity	\$4,770,000	\$4,355,000

#### Instructions

Determine the following measures for 2016, rounding to one decimal place:

- 1. Working capital
- 2. Current ratio
- 3. Quick ratio
- 4. Accounts receivable turnover
- 5. Number of days' sales in receivables
- 6. Inventory turnover
- 7. Number of days' sales in inventory
- 8. Ratio of fixed assets to long-term liabilities
- 9. Ratio of liabilities to stockholders' equity
- 10. Number of times interest charges are earned
- 11. Number of times preferred dividends are earned
- 12. Ratio of sales to assets
- 13. Rate earned on total assets
- 14. Rate earned on stockholders' equity
- 15. Rate earned on common stockholders' equity
- 16. Earnings per share on common stock
- 17. Price-earnings ratio
- 18. Dividends per share of common stock
- 19. Dividend yield

### PR 15-5A Solvency and profitability trend analysis

**OBJ. 2, 3** 

Addai Company has provided the following comparative information:

	2016	2015	2014	2013	2012
Net income	\$ 273,406	\$ 367,976	\$ 631,176	\$ 884,000	\$ 800,000
Interest expense	616,047	572,003	528,165	495,000	440,000
Income tax expense	31,749	53,560	106,720	160,000	200,000
Total assets (ending balance)	4,417,178	4,124,350	3,732,443	3,338,500	2,750,000
Total stockholders' equity					
(ending balance)	3,706,557	3,433,152	3,065,176	2,434,000	1,550,000
Average total assets	4,270,764	3,928,396	3,535,472	3,044,250	2,475,000
Average total stockholders' equity	3,569,855	3,249,164	2,749,588	1,992,000	1,150,000

You have been asked to evaluate the historical performance of the company over the last five years.

Selected industry ratios have remained relatively steady at the following levels for the last five years:

	2012-2016
Rate earned on total assets	28%
Rate earned on stockholders' equity	18%
Number of times interest charges are earned	2.7
Ratio of liabilities to stockholders' equity	0.4

#### **Instructions**

- 1. Prepare four line graphs with the ratio on the vertical axis and the years on the horizontal axis for the following four ratios (rounded to one decimal place):
  - a. Rate earned on total assets
  - b. Rate earned on stockholders' equity
  - c. Number of times interest charges are earned
  - d. Ratio of liabilities to stockholders' equity

Display both the company ratio and the industry benchmark on each graph. That is, each graph should have two lines.

2. Prepare an analysis of the graphs in (1).

### **Problems: Series B**

### PR 15-1B Horizontal analysis of income statement

OBJ. 1

For 2016, Macklin Inc. reported a significant increase in net income. At the end of the year, John Mayer, the president, is presented with the following condensed comparative income statement:

### Macklin Inc. Comparative Income Statement For the Years Ended December 31, 2016 and 2015

	2016	2015
Sales	\$910,000	\$700,000
Cost of goods sold	441,000	350,000
Gross profit	\$469,000	\$350,000
Selling expenses	\$ 139,150	\$115,000
Administrative expenses	99,450	85,000
Total operating expenses	\$238,600	\$200,000
Income from operations	\$230,400	\$150,000
Other income	65,000	50,000
Income before income tax	\$295,400	\$200,000
Income tax expense	65,000	50,000
Net income	\$230,400	\$150,000

✓ 1. Sales, 30.0% increase



General Ledger



### **Instructions**

- 1. Prepare a comparative income statement with horizontal analysis for the two-year period, using 2015 as the base year. Round to one decimal place.
- 2. To the extent the data permit, comment on the significant relationships revealed by the horizontal analysis prepared in (1).

### PR 15-2B Vertical analysis of income statement

OBJ. 1

For 2016, Fielder Industries Inc. initiated a sales promotion campaign that included the expenditure of an additional \$40,000 for advertising. At the end of the year, Leif Grando, the president, is presented with the following condensed comparative income statement:

### Fielder Industries Inc. Comparative Income Statement For the Years Ended December 31, 2016 and 2015

	2016	2015
Sales	\$1,300,000	\$1,180,000
Cost of goods sold	682,500	613,600
Gross profit	\$ 617,500	\$ 566,400
Selling expenses	\$ 260,000	\$ 188,800
Adminstrative expenses	169,000	177,000
Total operating expenses	\$ 429,000	\$ 365,800
Income from operations	\$ 188,500	\$ 200,600
Other income	78,000	70,800
Income before income tax	\$ 266,500	\$ 271,400
Income tax expense	117,000	106,200
Net income	\$ 149,500	\$ 165,200

### **Instructions**

- 1. Prepare a comparative income statement for the two-year period, presenting an analysis of each item in relationship to sales for each of the years. Round to one decimal place.
- 2. To the extent the data permit, comment on the significant relationships revealed by the vertical analysis prepared in (1).

#### PR 15-3B Effect of transactions on current position analysis

OBJ. 2

Data pertaining to the current position of Lucroy Industries Inc. are as follows:

Cash	\$ 800,000
Marketable securities	550,000
Accounts and notes receivable (net)	850,000
Inventories	700,000
Prepaid expenses	300,000
Accounts payable	1,200,000
Notes payable (short-term)	700,000
Accrued expenses	100,000

### Instructions

- 1. Compute (a) the working capital, (b) the current ratio, and (c) the quick ratio. Round to one decimal place.
- 2. List the following captions on a sheet of paper:

Transaction	Working Capital	Current Ratio	Quick Ratio

Compute the working capital, the current ratio, and the quick ratio after each of the following transactions, and record the results in the appropriate columns. *Consider each transaction separately* and assume that only that transaction affects the data given. Round to one decimal place.

(Continued)

✓ 1. Net income, 2015, 14.0%



General Ledger

✓ 2. g. Quick ratio, 1.6



- a. Sold marketable securities at no gain or loss, \$500,000.
- b. Paid accounts payable, \$287,500.
- c. Purchased goods on account, \$400,000.
- d. Paid notes payable, \$125,000.
- e. Declared a cash dividend, \$325,000.
- f. Declared a common stock dividend on common stock, \$150,000.
- g. Borrowed cash from bank on a long-term note, \$1,000,000.
- h. Received cash on account, \$75,000.
- i. Issued additional shares of stock for cash, \$2,000,000.
- j. Paid cash for prepaid expenses, \$200,000.

### PR 15-4B Nineteen measures of solvency and profitability

OBJ. 2, 3

The comparative financial statements of Stargel Inc. are as follows. The market price of Stargel Inc. common stock was \$119.70 on December 31, 2016.

### Stargel Inc. Comparative Retained Earnings Statement For the Years Ended December 31, 2016 and 2015

	2016	2015
Retained earnings, January 1	\$5,375,000	\$4,545,000
Add net income for year	900,000	925,000
Total	\$6,275,000	\$5,470,000
Deduct dividends:		
On preferred stock	\$ 45,000	\$ 45,000
On common stock	50,000	50,000
Total	\$ 95,000	\$ 95,000
Retained earnings, December 31	\$6,180,000	\$5,375,000

### Stargel Inc. Comparative Income Statement For the Years Ended December 31, 2016 and 2015

	2016	2015
Sales	\$10,000,000	\$9,400,000
Cost of goods sold	5,350,000	4,950,000
Gross profit	\$ 4,650,000	\$4,450,000
Selling expenses	\$ 2,000,000	\$1,880,000
Administrative expenses	1,500,000	1,410,000
Total operating expenses	\$ 3,500,000	\$3,290,000
Income from operations	\$ 1,150,000	\$1,160,000
Other income	150,000	140,000
	\$ 1,300,000	\$1,300,000
Other expense (interest)	170,000	150,000
Income before income tax	\$ 1,130,000	\$1,150,000
Income tax expense	230,000	225,000
Net income	\$ 900,000	\$ 925,000

✓ 9. Ratio of liabilities to stockholders' equity, 0.4



#### Stargel Inc. Comparative Balance Sheet December 31, 2016 and 2015

	Dec. 31, 2016	Dec. 31, 2015
Assets		
Current assets:		
Cash	\$ 500,000	\$ 400,000
Marketable securities	1,010,000	1,000,000
Accounts receivable (net)	740,000	510,000
Inventories	1,190,000	950,000
Prepaid expenses	250,000	229,000
Total current assets	\$3,690,000	\$3,089,000
Long-term investments	2,350,000	2,300,000
Property, plant, and equipment (net)	3,740,000	3,366,000
Total assets	\$9,780,000	\$8,755,000
Liabilities		
Current liabilities	\$ 900,000	\$ 880,000
Long-term liabilities:		
Mortgage note payable, 8.8%, due 2021	\$ 200,000	\$ 0
Bonds payable, 9%, due 2017	1,500,000	1,500,000
Total long-term liabilities	\$1,700,000	\$1,500,000
Total liabilities	\$2,600,000	\$2,380,000
Stockholders' Equity		
Preferred \$0.90 stock, \$10 par	\$ 500,000	\$ 500,000
Common stock, \$5 par	500,000	500,000
Retained earnings	6,180,000	5,375,000
Total stockholders' equity	\$7,180,000	\$6,375,000
Total liabilities and stockholders' equity	\$9,780,000	\$8,755,000

### **Instructions**

Determine the following measures for 2016, rounding to one decimal place, except pershare amounts, which should be rounded to the nearest penny:

- 1. Working capital
- 2. Current ratio
- 3. Quick ratio
- 4. Accounts receivable turnover
- 5. Number of days' sales in receivables
- 6. Inventory turnover
- 7. Number of days' sales in inventory
- 8. Ratio of fixed assets to long-term liabilities
- 9. Ratio of liabilities to stockholders' equity
- 10. Number of times interest charges are earned
- 11. Number of times preferred dividends are earned
- 12. Ratio of sales to assets
- 13. Rate earned on total assets
- 14. Rate earned on stockholders' equity
- 15. Rate earned on common stockholders' equity
- 16. Earnings per share on common stock
- 17. Price-earnings ratio
- 18. Dividends per share of common stock
- 19. Dividend yield

### PR 15-5B Solvency and profitability trend analysis

**OBJ. 2, 3** 

Crosby Company has provided the following comparative information:

	2016	2015	2014	2013	2012
Net income	\$ 5,571,720	\$ 3,714,480	\$ 2,772,000	\$ 1,848,000	\$ 1,400,000
Interest expense	1,052,060	891,576	768,600	610,000	500,000
Income tax expense	1,225,572	845,222	640,320	441,600	320,000
Total assets (ending balance)	29,378,491	22,598,839	17,120,333	12,588,480	10,152,000
Total stockholders' equity					
(ending balance)	18,706,200	13,134,480	9,420,000	6,648,000	4,800,000
Average total assets	25,988,665	19,859,586	14,854,406	11,370,240	8,676,000
Average total stockholders' equity	15,920,340	11,277,240	8,034,000	5,724,000	4,100,000

You have been asked to evaluate the historical performance of the company over the last five years.

Selected industry ratios have remained relatively steady at the following levels for the last five years:

	2012-2016
Rate earned on total assets	19%
Rate earned on stockholders' equity	26%
Number of times interest charges are earned	3.4
Ratio of liabilities to stockholders' equity	1.4

#### **Instructions**

- 1. Prepare four line graphs with the ratio on the vertical axis and the years on the horizontal axis for the following four ratios (rounded to one decimal place):
  - a. Rate earned on total assets
  - b. Rate earned on stockholders' equity
  - c. Number of times interest charges are earned
  - d. Ratio of liabilities to stockholders' equity

Display both the company ratio and the industry benchmark on each graph. That is, each graph should have two lines.

2. Prepare an analysis of the graphs in (1).

### Nike, Inc., Problem

### **Financial Statement Analysis**

The financial statements for Nike, Inc., are presented in Appendix B at the end of the text. The following additional information (in thousands) is available:

Accounts receivable at May 31, 2010	\$ 3,138
Inventories at May 31, 2010	2,715
Total assets at May 31, 2010	14,998
Stockholders' equity at May 31, 2010	9,843

#### **Instructions**

- 1. Determine the following measures for the fiscal years ended May 31, 2013 (fiscal 2012), and May 31, 2012 (fiscal 2011), rounding to one decimal place.
  - a. Working capital
  - b. Current ratio
  - c. Quick ratio
  - d. Accounts receivable turnover

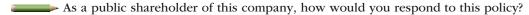
- e. Number of days' sales in receivables
- f. Inventory turnover
- g. Number of days' sales in inventory
- h. Ratio of liabilities to stockholders' equity
- i. Ratio of sales to assets
- j. Rate earned on total assets, assuming interest expense is \$23 million for the year ending May 31, 2013, and \$31 million for the year ending May 31, 2012
- k. Rate earned on common stockholders' equity
- Price-earnings ratio, assuming that the market price was \$61.66 per share on May 31, 2013, and \$53.10 per share on May 31, 2012
- m. Percentage relationship of net income to sales
- 2. What conclusions can be drawn from these analyses?

### **Cases & Projects**

### CP 15-1 Analysis of financing corporate growth

Assume that the president of Freeman Industries Inc. made the following statement in the Annual Report to Shareholders:

"The founding family and majority shareholders of the company do not believe in using debt to finance future growth. The founding family learned from hard experience during Prohibition and the Great Depression that debt can cause loss of flexibility and eventual loss of corporate control. The company will not place itself at such risk. As such, all future growth will be financed either by stock sales to the public or by internally generated resources."



### CP 15-2 Receivables and inventory turnover

Rodgers Industries Inc. has completed its fiscal year on December 31. The auditor, Josh McCoy, has approached the CFO, Aaron Mathews, regarding the year-end receivables and inventory levels of Rodgers Industries. The following conversation takes place:

Josh: We are beginning our audit of Rodgers Industries and have prepared ratio analyses to determine if there have been significant changes in operations or financial position. This helps us guide the audit process. This analysis indicates that the inventory turnover has decreased from 5.1 to 2.7, while the accounts receivable turnover has decreased from 11 to 7. Could you explain this change in operations?

Aaron: There is little need for concern. The inventory represents computers that we were unable to sell during the holiday buying season. We are confident, however, that we will be able to sell these computers as we move into the next fiscal year.

Josh: What gives you this confidence?

Aaron: We will increase our advertising and provide some very attractive price concessions to move these machines. We have no choice. Newer technology is already out there, and we have to unload this inventory.

Josh: ... and the receivables?

Aaron: As you may be aware, the company is under tremendous pressure to expand sales and profits. As a result, we lowered our credit standards to our commercial customers so that we would be able to sell products to a broader customer base. As a result of this policy change, we have been able to expand sales by 35%.

Josh: Your responses have not been reassuring to me.

Aaron: I'm a little confused. Assets are good, right? Why don't you look at our current ratio? It has improved, hasn't it? I would think that you would view that very favorably.

Why is Josh concerned about the inventory and accounts receivable turnover ratios and Aaron's responses to them? What action may Josh need to take? How would you respond to Aaron's last comment?



### CP 15-3 Vertical analysis

The condensed income statements through income from operations for Dell Inc. and Apple Inc. for recent fiscal years follow (numbers in millions of dollars):

	Dell Inc.	Apple Inc.
Sales	\$56,940	\$156,508
Cost of sales	44,754	87,846
Gross profit	\$12,186	\$68,662
Selling, general, and administrative expenses	\$ 8,102	\$10,040
Research and development	1,072	3,381
Operating expenses	\$ 9,174	\$13,421
Income from operations	\$ 3,012	\$55,241

Prepare comparative common-sized statements, rounding percents to one decimal place. Interpret the analyses.



### CP 15-4 Profitability and stockholder ratios

Deere & Co. manufactures and distributes farm and construction machinery that it sells around the world. In addition to its manufacturing operations, Deere & Co.'s credit division loans money to customers to finance the purchase of their farm and construction equipment.

The following information is available for three recent years (in millions except pershare amounts):

	Year 3	Year 2	Year 1
Net income (loss)	\$3,064.7	\$2,799.9	\$1,865.0
Preferred dividends	\$0.00	\$0.00	\$0.00
Interest expense	\$782.8	\$759.4	\$811.4
Shares outstanding for			
computing earnings per share	397	417	424
Cash dividend per share	\$1.79	\$1.52	\$1.16
Average total assets	\$52,237	\$45,737	\$42,200
Average stockholders' equity	\$6,821	\$6,545	\$5,555
Average stock price per share	\$79.27	\$80.48	\$61.18

- 1. Calculate the following ratios for each year (Round percentages to one decimal place):
  - a. Rate earned on total assets
  - b. Rate earned on stockholders' equity
  - c. Earnings per share
  - d. Dividend yield
  - e. Price-earnings ratio
- 2. What is the ratio of average liabilities to average stockholders' equity for Year 3?
- 3. Based on these data, evaluate Deere & Co.'s performance.



### **CP 15-5** Comprehensive profitability and solvency analysis

Marriott International, Inc., and Hyatt Hotels Corporation are two major owners and managers of lodging and resort properties in the United States. Abstracted income statement information for the two companies is as follows for a recent year:

	Marriott (in millions)	Hyatt (in millions)
Operating profit before other expenses and interest	\$ 677	\$ 39
Other income (expenses)	54	118
Interest expense	(180)	(54)
Income before income taxes	\$ 551	\$103
Income tax expense	93	37
Net income	\$ 458	\$ 66

Balance sheet information is as follows:

	Marriott (in millions)	Hyatt (in millions)
Total liabilities	\$7,398	\$2,125
Total stockholders' equity	<u> 1,585</u>	_5,118
Total liabilities and stockholders' equity	\$8,983	\$7,243

The average liabilities, average stockholders' equity, and average total assets were as follows:

	Marriott (in millions)	Hyatt (in millions)
Average total liabilities	\$7,095	\$2,132
Average total stockholders' equity	1,364	5,067
Average total assets	8,458	7,199

- 1. Determine the following ratios for both companies (round to one decimal place after the whole percent):
  - a. Rate earned on total assets
  - b. Rate earned on stockholders' equity
  - c. Number of times interest charges are earned
  - d. Ratio of liabilities to stockholders' equity
- 2. Analyze and compare the two companies, using the information in (1).



# Managerial Accounting Concepts and Principles

### Washburn Guitars

Paul Stanley, guitarist for the legendary rock band **KISS**, has entertained millions of fans playing his guitar. His guitar was built by quality craftsmen at **Washburn Guitars** in Chicago. Washburn Guitars is well-known in the music industry and has been in business for more than 120 years.

Staying in business for 120 years requires a thorough understanding of how to manufacture high-quality guitars. In addition, it requires knowledge of how to account for the costs of making guitars. For example, Washburn needs cost information to answer the following questions:

- How much should be charged for its guitars?
- How many guitars does it have to sell in a year to cover its costs and earn a profit?

- How many employees should the company have working on each stage of the manufacturing process?
- How would purchasing automated equipment affect the costs of its guitars?

This chapter introduces managerial accounting concepts that are useful in addressing these questions.

This chapter begins by describing managerial accounting and its relationship to financial accounting. Following this overview, the management process is described along with the role of managerial accounting in this process. Finally, characteristics of managerial accounting reports, managerial accounting terms, and uses of managerial accounting information are described and illustrated.





### **Managerial Accounting**

Managers make numerous decisions during the day-to-day operations of a business and in planning for the future. Managerial accounting provides much of the information used for these decisions.

Some examples of managerial accounting information along with the chapter in which it is described and illustrated follow:

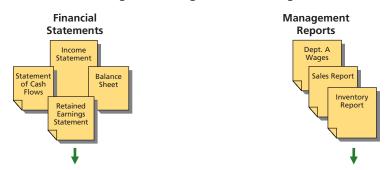
- Classifying manufacturing and other costs and reporting them in the financial statements (Chapter 16)
- Determining the cost of manufacturing a product or providing a service (Chapters 17 and 18)
- Estimating the behavior of costs for various levels of activity and assessing cost-volumeprofit relationships (Chapter 19)
- Evaluating operating performance using cost behavior relationships (Chapter 20)
- Planning for the future by preparing budgets (Chapter 21)
- Evaluating manufacturing costs by comparing actual with expected results (Chapter 22)
- Evaluating decentralized operations by comparing actual and budgeted costs as well as computing various measures of profitability (Chapter 23)
- Evaluating special decision-making situations by comparing differential revenues and costs, and allocating product costs using activity-based costing (Chapter 24)
- Evaluating alternative proposals for long-term investments in fixed assets (Chapter 25)
- Evaluating the impact of cost allocation on pricing products and services (Chapter 26)
- Planning operations using just-in-time concepts (Chapter 27)

## Differences Between Managerial and Financial Accounting

Accounting information is often divided into two types: financial and managerial. Exhibit 1 shows the relationship between financial accounting and managerial accounting.

### **EXHIBIT 1**

### **Financial Accounting and Managerial Accounting**



	Financial Statements	Management Reports
Users of Information	External users and company management	Management
Nature of Information	Objective	Objective and subjective
<b>Guidelines for Preparation</b>	Prepared according to GAAP	Prepared according to management needs
Timeliness of Reporting	Prepared at fixed intervals	Prepared at fixed intervals and on an as-needed basis
Focus of Reporting	Company as a whole	Company as a whole or segment

**Financial accounting** information is reported at fixed intervals (monthly, quarterly, yearly) in general-purpose financial statements. These financial statements—the income statement, retained earnings statement, balance sheet, and statement of cash flows—are prepared according to generally accepted accounting principles (GAAP). These statements are used by external users such as the following:

- Shareholders
- Creditors
- Government agencies
- The general public

Managers of a company also use general-purpose financial statements. For example, in planning future operations, managers often begin by evaluating the current income statement and statement of cash flows.

**Managerial accounting** information is designed to meet the specific needs of a company's management. This information includes the following:

- Historical data, which provide *objective measures* of past operations
- Estimated data, which provide subjective estimates about future decisions

Management uses both types of information in directing daily operations, planning future operations, and developing business strategies.

Unlike the financial statements prepared in financial accounting, managerial accounting reports do *not* always have to be:

- Prepared according to generally accepted accounting principles (GAAP). This is because *only* the company's management uses the information. Also, in many cases, GAAP are not relevant to the specific decision-making needs of management.
- Prepared at fixed intervals (monthly, quarterly, yearly). Although some management reports are prepared at fixed intervals, most reports are prepared as management needs the information.
- Prepared for the business as a whole. Most management reports are prepared for products, projects, sales territories, or other segments of the company.

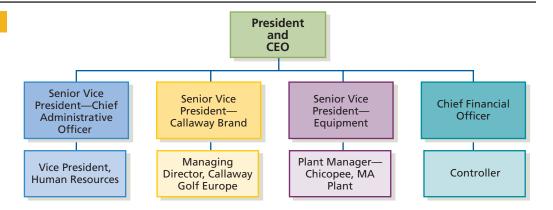
### The Management Accountant in the Organization

In most companies, departments or similar organizational units are assigned responsibilities for specific functions or activities. The operating structure of a company can be shown in an *organization chart*.

Exhibit 2 is a partial organization chart for Callaway Golf Company, the manufacturer and distributor of golf clubs, clothing, and other products.

### **EXHIBIT 2**

Partial Organization Chart for Callaway Golf Company



The departments in a company can be viewed as having either of the following:

- Line responsibilities
- Staff responsibilities

A **line department** is directly involved in providing goods or services to the customers of the company. For Callaway Golf (shown in Exhibit 2), the following occupy line positions:

- Senior Vice President—Equipment
- Plant Manager-Chicopee, MA Plant
- Senior Vice President—Callaway Brand
- Managing Director, Callaway Golf Europe

Individuals in these positions are responsible for manufacturing and selling Callaway's products.

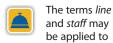
A **staff department** provides services, assistance, and advice to the departments with line or other staff responsibilities. A staff department has no direct authority over a line department. For Callaway Golf (Exhibit 2), the following are staff positions:

- Senior VP—Chief Administrative Officer
- Vice President, Human Resources
- Chief Financial Officer
- Controller

In most companies, the **controller** is the chief management accountant. The controller's staff consists of a variety of other accountants who are responsible for specialized accounting functions such as the following:

- · Systems and procedures
- General accounting
- · Budgets and budget analysis
- Special reports and analysis
- Taxes
- Cost accounting

Experience in managerial accounting is often an excellent training ground for senior management positions. This is not surprising because accounting touches all phases of a company's operations.



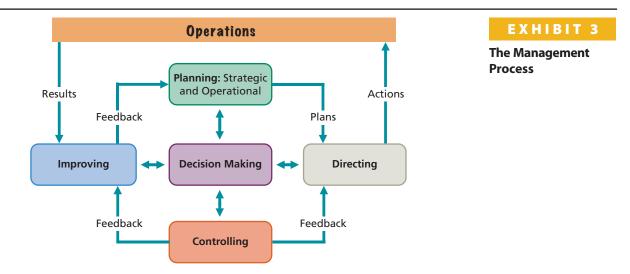
service organizations. For example, the line positions in a hospital would be the nurses, doctors, and other caregivers. Staff positions would include admissions and records.

### **Managerial Accounting in the Management Process**

As a staff department, managerial accounting supports management and the management process. The **management process** has the following five basic phases, as shown in Exhibit 3:

- Planning
- Directing
- Controlling
- Improving
- Decision making

As Exhibit 3 illustrates, the five phases interact with one another.



**Planning** Management uses **planning** in developing the company's **objectives (goals)** and translating these objectives into courses of action. For example, a company may set an objective to increase market share by 15% by introducing three new products. The actions to achieve this objective might be as follows:

- Increase the advertising budget
- Open a new sales territory
- Increase the research and development budget

Planning may be classified as follows:

- Strategic planning, which is developing long-term actions to achieve the company's
  objectives. These long-term actions are called strategies, which often involve periods
  of 5 to 10 years.
- Operational planning, which develops short-term actions for managing the day-to-day operations of the company.

**Directing** The process by which managers run day-to-day operations is called **directing**. An example of directing is a production supervisor's efforts to keep the production line moving without interruption (downtime). A credit manager's development of guidelines for assessing the ability of potential customers to pay their bills is also an example of directing.

**Controlling** Monitoring operating results and comparing actual results with the expected results is **controlling**. This **feedback** allows management to isolate areas for further investigation and possible remedial action. It may also lead to revising future plans. This philosophy of controlling by comparing actual and expected results is called **management by exception**.

**Improving** Feedback is also used by managers to support continuous process improvement. **Continuous process improvement** is the philosophy of continually improving employees, business processes, and products. The objective of continuous improvement is to eliminate the *source* of problems in a process. In this way, the right products (services) are delivered in the right quantities at the right time.

**Decision Making** Inherent in each of the preceding management processes is **decision making**. In managing a company, management must continually decide among alternative actions. For example, in directing operations, managers must decide on an operating structure, training procedures, and staffing of day-to-day operations.

Managerial accounting supports managers in all phases of the management process. For example, accounting reports comparing actual and expected operating results help managers plan and improve current operations. Such a report might compare the actual and expected costs of defective materials. If the cost of defective materials is unusually high, management might decide to change suppliers.

### Example Exercise 16-1 Management Process



Three phases of the management process are planning, controlling, and improving. Match the following descriptions to the proper phase:

### Phase of management process

### **Planning**

#### Controlling

**Improving** 

### Description

- Monitoring the operating results of implemented plans and comparing the actual results with expected results.
- b. Rejects solving individual problems with temporary solutions that fail to address the root cause of the problem.
- c. Used by management to develop the company's objectives.

### Follow My Example 16-1

Planning (c), Controlling (a), and Improving (b).

Practice Exercises: PE 16-1A, PE 16-1B

### Integrity, Objectivity, and Ethics in Business



### **ENVIRONMENTAL MANAGERIAL ACCOUNTING**

Throughout the last decade, environmental issues have become an increasingly important part of the business environment for most companies. Companies and managers must now consider the environmental impact of their business decisions in the same way that they would consider other operational issues. To help managers make sound business decisions, the emerging field of environmental management accounting focuses

on calculating the environmental-related costs of business decisions. Environmental managerial accountants evaluate a variety of issues such as the volume and level of emissions, the estimated costs of different levels of emissions, and the impact that environmental costs have on product cost. Managers use these results to consider clearly the environmental effects of their business decisions.



# **Manufacturing Operations: Costs and Terminology**

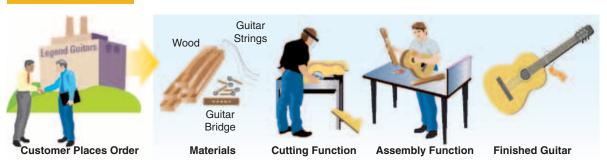
The operations of a business can be classified as service, merchandising, or manufacturing. The accounting for service and merchandising businesses has been described and illustrated in earlier chapters. For this reason, the remaining chapters of this

text focus primarily on manufacturing businesses. Most of the managerial accounting concepts discussed, however, also apply to service and merchandising businesses.

As a basis for illustration of manufacturing operations, a guitar manufacturer, **Legend Guitars**, is used. Exhibit 4 is an overview of Legend's guitar manufacturing operations.



#### **Guitar-Making Operations of Legend Guitars**



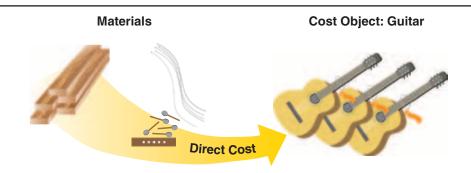
Legend's guitar-making process begins when a customer places an order for a guitar. Once the order is accepted, the manufacturing process begins by obtaining the necessary materials. An employee then cuts the body and neck of the guitar out of raw lumber. Once the wood is cut, the body and neck of the guitar are assembled. When the assembly is complete, the guitar is painted and finished.

### **Direct and Indirect Costs**

A **cost** is a payment of cash or the commitment to pay cash in the future for the purpose of generating revenues. For example, cash (or credit) used to purchase equipment is the cost of the equipment. If equipment is purchased by exchanging assets other than cash, the current market value of the assets given up is the cost of the equipment purchased.

In managerial accounting, costs are classified according to the decision-making needs of management. For example, costs are often classified by their relationship to a segment of operations, called a **cost object**. A cost object may be a product, a sales territory, a department, or an activity, such as research and development. Costs identified with cost objects are either direct costs or indirect costs.

**Direct costs** are identified with and can be traced to a cost object. For example, as shown in Exhibit 5, the cost of wood (materials) used by **Legend Guitars** in manufacturing a guitar is a direct cost of the guitar.



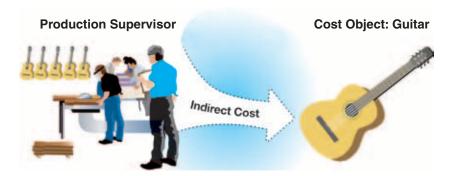
**EXHIBIT 5** 

Direct Costs of Legend Guitars

**Indirect costs** cannot be identified with or traced to a cost object. For example, as shown in Exhibit 6, the salaries of the **Legend Guitars** production supervisors are indirect costs of producing a guitar. Although the production supervisors contribute to the production of a guitar, their salaries cannot be identified with or traced to any individual guitar.

#### **EXHIBIT 6**

Indirect Costs of Legend Guitars



Depending on the cost object, a cost may be either a direct or an indirect cost. For example, the salaries of production supervisors are indirect costs when the cost object is an individual guitar. If, however, the cost object is Legend Guitars' overall production process, then the salaries of production supervisors are direct costs.

This process of classifying a cost as direct or indirect is illustrated in Exhibit 7.

#### **EXHIBIT 7**

Classifying Direct and Indirect Costs



### **Manufacturing Costs**

The cost of a manufactured product includes the cost of materials used in making the product. In addition, the cost of a manufactured product includes the cost of converting the materials into a finished product. For example, **Legend Guitars** uses employees and machines to convert wood (and other supplies) into finished guitars. Thus, as shown in Exhibit 8, the cost of a finished guitar (the cost object) includes the following:

- Direct materials cost
- Direct labor cost
- Factory overhead cost

#### **EXHIBIT 8**

Manufacturing Costs of Legend Guitars



**Direct Materials** 

**Direct Labor** 

**Factory Overhead** 

**Direct Materials Cost** Manufactured products begin with raw materials that are converted into finished products. The cost of any material that is an integral part of the finished product is classified as a **direct materials cost**. For **Legend Guitars**, direct materials cost includes the cost of the wood used in producing each guitar. Other examples of direct materials costs include the cost of electronic components for a television, silicon wafers for microcomputer chips, and tires for an automobile.

To be classified as a direct materials cost, the cost must be both of the following:

- · An integral part of the finished product
- A significant portion of the total cost of the product

For Legend, the cost of the guitar strings is not a direct materials cost. This is because the cost of guitar strings is an insignificant part of the total cost of each guitar. Instead, the cost of guitar strings is classified as a factory overhead cost, which is discussed later.

**Direct Labor Cost** Most manufacturing processes use employees to convert materials into finished products. The cost of employee wages that is an integral part of the finished product is classified as **direct labor cost**. For **Legend Guitars**, direct labor cost includes the wages of the employees who cut each guitar out of raw lumber and assemble it. Other examples of direct labor costs include mechanics' wages for repairing an automobile, machine operators' wages for manufacturing tools, and assemblers' wages for assembling a laptop computer.

Like a direct materials cost, a direct labor cost must meet both of the following criteria:

- · An integral part of the finished product
- A significant portion of the total cost of the product

For Legend, the wages of the janitors who clean the factory are not a direct labor cost. This is because janitorial costs are not an integral part or a significant cost of each guitar. Instead, janitorial costs are classified as a factory overhead cost, which is discussed next.

**Factory Overhead Cost** Costs other than direct materials and direct labor that are incurred in the manufacturing process are combined and classified as **factory overhead cost**. Factory overhead is sometimes called **manufacturing overhead** or **factory burden**.

All factory overhead costs are indirect costs of the product. Some factory overhead costs include the following:

- Heating and lighting the factory
- Repairing and maintaining factory equipment
- Property taxes on factory buildings and land
- Insurance on factory buildings
- Depreciation on factory plant and equipment

Factory overhead cost also includes materials and labor costs that do not enter directly into the finished product. Examples include the cost of oil used to lubricate machinery and the wages of janitorial and supervisory employees. Also, if the costs of direct materials or direct labor are not a significant portion of the total product cost, these costs may be classified as factory overhead costs.

For **Legend Guitars**, the costs of guitar strings and janitorial wages are factory overhead costs. Additional factory overhead costs of making guitars are as follows:

processes have become more automated, direct labor costs have become

As manufacturing

costs have become so small that in some situations they are included as part of factory overhead.

- Sandpaper
- Buffing compound
- Glue
- Power (electricity) to run the machines
- Depreciation of the machines and building
- Salaries of production supervisors

### Example Exercise 16-2 Direct Materials, Direct Labor, and Factory Overhead



Identify the following costs as direct materials (DM), direct labor (DL), or factory overhead (FO) for a baseball glove manufacturer:

- a. Leather used to make a baseball glove
- b. Coolants for machines that sew baseball gloves
- c. Wages of assembly line employees
- d. Ink used to print a player's autograph on a baseball glove

(Continued)

### Follow My Example 16-2

- a. DM
- b. FO
- c. DL
- d. FO

Practice Exercises: PE 16-2A, PE 16-2B

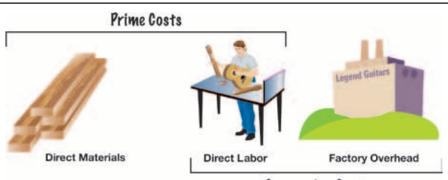
**Prime Costs and Conversion Costs** Direct materials, direct labor, and factory overhead costs may be grouped together for analysis and reporting. Two such common groupings are as follows:

- Prime costs, which consist of direct materials and direct labor costs
- Conversion costs, which consist of direct labor and factory overhead costs

Conversion costs are the costs of converting the materials into a finished product. Direct labor is both a prime cost and a conversion cost, as shown in Exhibit 9.

#### **EXHIBIT 9**

Prime Costs and Conversion Costs



Conversion Costs

### Example Exercise 16-3 Prime and Conversion Costs

(OBJ )

Identify the following costs as a prime cost (P), conversion cost (C), or both (B) for a baseball glove manufacturer:

- a. Leather used to make a baseball glove
- b. Coolants for machines that sew baseball gloves
- c. Wages of assembly line employees
- d. Ink used to print a player's autograph on a baseball glove

#### Follow My Example 16-3

- a. P
- b. C
- c. B
- d. C

Practice Exercises: PE 16-3A, PE 16-3B

#### Note:

Product costs consist of direct materials, direct labor, and factory overhead costs.

**Product Costs and Period Costs** For financial reporting purposes, costs are classified as product costs or period costs.

- Product costs consist of manufacturing costs: direct materials, direct labor, and factory overhead.
- **Period costs** consist of selling and administrative expenses. *Selling expenses* are incurred in marketing the product and delivering the product to customers. *Administrative*

expenses are incurred in managing the company and are not directly related to the manufacturing or selling functions.

Examples of product costs and period costs for **Legend Guitars** are presented in Exhibit 10.

#### **EXHIBIT 10**

#### **Examples of Product Costs and Period Costs—Legend Guitars**



### Period (Nonmanufacturing) Costs

#### **Selling Expenses**

- Advertising expenses
- Sales salaries expenses
- Commissions expenses

#### **Administrative Expenses**

Salary of production supervisors

- Office salaries expense
- Office supplies expense
- Depreciation expense—office building and equipment

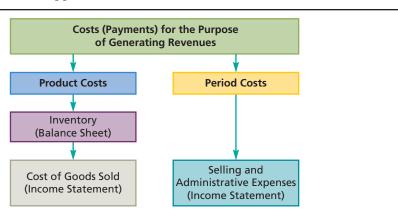
**EXHIBIT 11** 

**Financial Statements** 

Product Costs, Period Costs, and the

To facilitate control, selling and administrative expenses may be reported by level of responsibility. For example, selling expenses may be reported by products, salespersons, departments, divisions, or territories. Likewise, administrative expenses may be reported by areas such as human resources, computer services, legal, accounting, or finance.

The impact on the financial statements of product and period costs is summarized in Exhibit 11. As product costs are incurred, they are recorded and reported on the balance sheet as *inventory*. When the inventory is sold, the cost of the manufactured product sold is reported as *cost of goods sold* on the income statement. Period costs are reported as *expenses* on the income statement in the period in which they are incurred and, thus, never appear on the balance sheet.



### Example Exercise 16-4 Product and Period Costs



Identify the following costs as a product cost or a period cost for a baseball glove manufacturer:

- a. Leather used to make a baseball glove
- b. Cost of endorsement from a professional baseball player
- c. Office supplies used at the company headquarters
- d. Ink used to print a player's autograph on the baseball glove

#### Follow My Example 16-4

- a. Product cost
- b. Period cost
- c. Period cost
- d. Product cost

Practice Exercises: PE 16-4A, PE 16-4B



## Business Connection

#### **OVERHEAD COSTS**

Defense contractors such as General Dynamics, Boeing, and Lockheed Martin sell products such as airplanes, ships, and military equipment to the U.S. Department of Defense. Building large products such as these requires a significant investment in facilities and tools, all of which are classified as factory overhead costs. As a result, factory overhead costs are a much larger portion of the cost of goods sold for defense contractors than it is in other industries. For example, a U.S. General Accounting Office study of six defense contractors found that overhead costs were almost one-third of the price of the final product. This is more than three times greater than the factory overhead costs for a laptop computer, which are typically about 10% of the price of the final product.



### **Financial Statements for a Manufacturing Business**

The retained earnings and cash flow statements for a manufacturing business are similar to those illustrated in earlier chapters for service and merchandising businesses. However, the balance sheet and income statement for a manufacturing business are more complex. This is because a manufacturer makes the products that it sells and, thus, must record and report product costs. The reporting of product costs primarily affects the balance sheet and the income statement.

### **Balance Sheet for a Manufacturing Business**

A manufacturing business reports three types of inventory on its balance sheet as follows:

- Materials inventory (sometimes called raw materials inventory). This inventory consists of the costs of the direct and indirect materials that have not entered the manufacturing process.
  - Examples for Legend Guitars: Wood, guitar strings, glue, sandpaper
- Work in process inventory. This inventory consists of the direct materials, direct labor, and factory overhead costs for products that have entered the manufacturing process, but are not yet completed (in process).
  - Example for Legend: Unfinished (partially assembled) guitars

 Finished goods inventory. This inventory consists of completed (or finished) products that have not been sold.

Example for Legend: Unsold guitars

Exhibit 12 illustrates the reporting of inventory on the balance sheet for a merchandising and a manufacturing business. MusicLand Stores, Inc., a retailer of musical instruments, reports only Merchandise Inventory. In contrast, **Legend Guitars**, a manufacturer of guitars, reports Finished Goods, Work in Process, and Materials inventories. In both balance sheets, inventory is reported in the Current Assets section.

#### 

#### **EXHIBIT 12**

Balance Sheet
Presentation
of Inventory in
Manufacturing
and Merchandising
Companies

Legend Guitars Balance Sheet December 31, 2016		
Current assets:  Cash		\$ 21,000 120,000
Finished goods.  Work in process	\$62,500 24,000	
Materials	35,000	121,500
Supplies  Total current assets		2,000 \$ 264,500

### **Income Statement for a Manufacturing Business**

The income statements for merchandising and manufacturing businesses differ primarily in the reporting of the cost of merchandise (goods) *available for sale* and *sold* during the period. These differences are shown in Exhibit 13.

#### **Merchandising Business**

#### **Income Statement** Sales **\$XXX** Beginning merchandise inventory \$XXX Plus net purchases XXX Merchandise available for sale **\$XXX** Less ending merchandise inventory XXX Cost of merchandise sold XXX Gross profit \$XXX

#### **Manufacturing Business**

Income Statement			
Sales		\$XXX	
Beginning finished			
goods inventory	\$XXX		
Plus cost of goods manufactured	XXX		
Cost of finished goods			
available for sale	\$XXX		
Less ending finished			
goods inventory	XXX		
Cost of goods sold		XXX	
Gross profit		\$XXX	

#### **EXHIBIT 13**

Income Statements for Merchandising and Manufacturing Businesses A merchandising business purchases merchandise ready for resale to customers. The total cost of the **merchandise available for sale** during the period is determined as follows:

The **cost of merchandise sold** is determined as follows:

Cost of Merchandise _ Ending Merchandise = Cost of Merchandise Sold

Available for Sale | Inventory |

A manufacturer makes the products it sells, using direct materials, direct labor, and factory overhead. The total cost of making products that are available for sale during the period is called the **cost of goods manufactured**.

The cost of finished goods available for sale is determined as follows:

Beginning Finished + Cost of Goods Manufactured = Cost of Finished Goods
Goods Inventory + During the Period = Available for Sale

The cost of goods sold is determined as follows:

Cost of goods manufactured is required to determine the cost of goods sold and, thus, to prepare the income statement. The cost of goods manufactured is often determined by preparing a **statement of cost of goods manufactured**.¹ This statement summarizes the cost of goods manufactured during the period, as follows:

#### **Statement of Cost of Goods Manufactured**

Beginning work in process inventory			\$XXX
Direct materials:			
Beginning materials inventory	\$XXX		
Purchases	XXX		
Cost of materials available for use	\$XXX		
Less ending materials inventory	XXX		
Cost of direct materials used		\$XXX	
Direct labor		XXX	
Factory overhead		XXX	
Total manufacturing costs incurred			XXX
Total manufacturing costs			\$XXX
Less ending work in process inventory			XXX
Cost of goods manufactured			\$XXX

To illustrate, the following data for Legend Guitars are used:

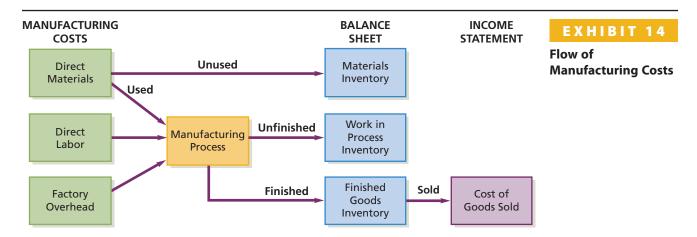
	Jan. 1, 2016	Dec. 31, 2016
Inventories:		
Materials	\$ 65,000	\$ 35,000
Work in process	30,000	24,000
Finished goods	60,000	62,500
Total inventories	\$155,000	\$121,500
Manufacturing costs incurred during 2016:	<del></del>	<del></del>
Materials purchased		\$100,000
Direct labor		110,000
Factory overhead:		
Indirect labor	\$ 24,000	
Depreciation on factory equipment	10,000	
Factory supplies and utility costs	10,000	44,000
Total		\$254,000
Sales		\$366,000
Selling expenses		20,000
Administrative expenses		15,000

¹ Chapters 17 and 18 describe and illustrate the use of job order and process cost systems. As will be discussed, these systems do not require a statement of cost of goods manufactured.

The statement of cost of goods manufactured is prepared using the following three steps:

- Step 1. Determine the cost of materials used.
- Step 2. Determine the total manufacturing costs incurred.
- Step 3. Determine the cost of goods manufactured.

Exhibit 14 summarizes how manufacturing costs flow to the income statement and balance sheet of a manufacturing business.



Using the data for **Legend Guitars**, the steps for determining the cost of materials used, total manufacturing costs incurred, and cost of goods manufactured are computed as follows:

Step 1. The cost of materials used in production is determined as follows:

Materials inventory, January 1, 2016	\$ 65,000
Add materials purchased	100,000
Cost of materials available for use	\$ 165,000
Less materials inventory, December 31, 2016	35,000
Cost of direct materials used	\$130,000

The January 1, 2016 (beginning), materials inventory of \$65,000 is added to the cost of materials purchased of \$100,000 to yield the \$165,000 total cost of materials that are available for use during 2016. Deducting the December 31, 2016 (ending), materials inventory of \$35,000 yields the \$130,000 cost of direct materials used in production.

Step 2. The total manufacturing costs incurred is determined as follows:

Direct materials used in production (Step 1)	\$130,000 <
Direct labor	110,000
Factory overhead	44,000
Total manufacturing costs incurred	\$284,000

The total manufacturing costs incurred in 2016 of \$284,000 are determined by adding the direct materials used in production (Step 1), the direct labor cost, and the factory overhead costs.

Step 3. The cost of goods manufactured is determined as follows:

Work in process inventory, January 1, 2016	\$ 30,000	
Total manufacturing costs incurred (Step 2)	284,000 <	
Total manufacturing costs	\$314,000	
Less work in process inventory, December 31, 2016	24,000	
Cost of goods manufactured	\$290,000	

The cost of goods manufactured of \$290,000 is determined by adding the total manufacturing costs incurred (Step 2) to the January 1, 2016 (beginning), work in process inventory of \$30,000. This yields total manufacturing costs of \$314,000. The December 31, 2016 (ending), work in process inventory of \$24,000 is then deducted to determine the cost of goods manufactured of \$290,000.

The income statement and statement of cost of goods manufactured for **Legend Guitars** are shown in Exhibit 15.

### EXHIBIT 15

Manufacturing Company—Income Statement with Statement of Cost of Goods Manufactured



Legend Guitars Income Statement For the Year Ended December 31, 2016		
Sales		\$366,000
Cost of goods sold:		
Finished goods inventory, January 1, 2016	\$ 60,000	
Cost of goods manufactured	290,000	
Cost of finished goods available for sale	\$350,000	
Less finished goods inventory, December 31, 2016	62,500	
Cost of goods sold		287,500
Gross profit		\$ 78,500
Operating expenses:		
Selling expenses	\$ 20,000	
Administrative expenses	15,000	
Total operating expenses		35,000
Net income		\$ 43,500

Legend Guitars Statement of Cost of Goods Manufactured For the Year Ended December 31, 2016			
Work in process inventory, January 1, 2016			\$ 30,000
Direct materials:			
Materials inventory, January 1, 2016	\$ 65,000		
Purchases	100,000		
Cost of materials available for use	\$165,000		
Less materials inventory, December 31, 2016	35,000		
Cost of direct materials used		\$130,000	
Direct labor		110,000	
Factory overhead:			
Indirect labor	\$ 24,000		
Depreciation on factory equipment	10,000		
Factory supplies and utility costs	10,000		
Total factory overhead		44,000	
Total manufacturing costs incurred			284,000
Total manufacturing costs			\$314,000
Less work in process inventory, December 31, 2016			24,000
Cost of goods manufactured			\$290,000

### Example Exercise 16-5 Cost of Goods Sold, Cost of Goods Manufactured

OBJ

Gauntlet Company has the following information for January:

Cost of direct materials used in production	\$25,000
Direct labor	35,000
Factory overhead	20,000
Work in process inventory, January 1	30,000
Work in process inventory, January 31	25,000
Finished goods inventory, January 1	15,000
Finished goods inventory, January 31	12,000

For January, determine (a) the cost of goods manufactured and (b) the cost of goods sold.

Follo	w My Example 16-5		
1 0110			
a.	Work in process inventory, January 1		\$ 30,000
	Cost of direct materials used in production	\$ 25,000	
	Direct labor	35,000	
	Factory overhead	20,000	
	Total manufacturing costs incurred during January		80,000
	Total manufacturing costs		\$110,000
	Less work in process inventory, January 31		25,000
	Cost of goods manufactured		\$ 85,000
b.	Finished goods inventory, January 1	\$ 15,000	
	Cost of goods manufactured	85,000	
	Cost of finished goods available for sale	\$100,000	
	Less finished goods inventory, January 31	12,000	
	Cost of goods sold	\$ 88,000	

### **Uses of Managerial Accounting**



Practice Exercises: PE 16-5A, PE 16-5B

As mentioned earlier, managerial accounting provides information and reports for managers to use in operating a business. Some examples of how managerial accounting could be used by **Legend Guitars** include the following:

- The cost of manufacturing each guitar could be used to determine its selling price.
- Comparing the costs of guitars over time can be used to monitor and control the cost of direct materials, direct labor, and factory overhead.
- Performance reports could be used to identify any large amounts of scrap or employee downtime. For example, large amounts of unusable wood (scrap) after the cutting process should be investigated to determine the underlying cause. Such scrap may be caused by saws that have not been properly maintained.
- A report could analyze the potential efficiencies and dollar savings of purchasing a new computerized saw to speed up the production process.
- A report could analyze how many guitars need to be sold to cover operating costs and expenses. Such information could be used to set monthly selling targets and bonuses for sales personnel.

As the prior examples illustrate, managerial accounting information can be used for a variety of purposes. In the remaining chapters of this text, we examine these and other areas of managerial accounting.

## Service Focus



### MANAGERIAL ACCOUNTING IN THE **SERVICE INDUSTRY**

All businesses can benefit from managerial accounting, whether they manufacture a product or provide a service. Service businesses such as professional service firms, restaurants, maintenance companies, and airlines need managerial accounting information to direct daily operations, plan future operations, and develop business strategies.

For example, The Walt Disney Company relies heavily on managerial accounting to manage its operations. Disney uses budgets and financial forecasts to plan costs and allocate resources between its various business units.

Based on these budgets and financial forecasts, Disney directs its operations by determining how to staff its theme parks and off cycle its theme park rides for maintenance. Operations are controlled by a variety of qualitative and quantitative metrics that provide feedback on the efficiency and quality of the customer experience. To ensure the best guest experience, Disney Theme Parks manages operations in small business units to maximize management ownership and responsibility. The results of Disney's deployment and use of managerial accounting have been impressive. The Walt Disney Company is typically ranked number 1 in Fortune's listing of the 10 most admired companies for quality.

# At a Glance 16



#### Describe managerial accounting and the role of managerial accounting in a business.

**Key Points** Managerial accounting is a staff function that supports the management process by providing reports to aid management in planning, directing, controlling, improving, and decision making. This differs from financial accounting, which provides information to users outside of the organization. Managerial accounting reports are designed to meet the specific needs of management and aid management in planning long-term strategies and running the day-to-day operations.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the differences between financial accounting and managerial accounting.</li> </ul>		
• Describe the role of the management accountant in the organization.		
<ul> <li>Describe the role of managerial accounting in the management process.</li> </ul>	EE16-1	PE16-1A, 16-1B



Describe and illustrate the following costs: direct and indirect costs; direct materials, direct labor, and factory overhead costs; and product and period costs.

**Key Points** Manufacturing companies use machinery and labor to convert materials into a finished product. A direct cost can be directly traced to a finished product, while an indirect cost cannot. The cost of a finished product is made up of three components: direct materials, direct labor, and factory overhead.

These three manufacturing costs can be categorized into prime costs (direct materials and direct labor) or conversion costs (direct labor and factory overhead). Product costs consist of the elements of manufacturing cost—direct materials, direct labor, and factory overhead—while period costs consist of selling and administrative expenses.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe a cost object.		
<ul> <li>Classify a cost as a direct or an indirect cost for a cost object.</li> </ul>		
Describe direct materials cost.	EE16-2	PE16-2A, 16-2B
Describe direct labor cost.	EE16-2	PE16-2A, 16-2B
Describe factory overhead cost.	EE16-2	PE16-2A, 16-2B
<ul> <li>Describe prime costs and conversion costs.</li> </ul>	EE16-3	PE16-3A, 16-3B
<ul> <li>Describe product costs and period costs.</li> </ul>	EE16-4	PE16-4A, 16-4B



Describe and illustrate the following statements for a manufacturing business: balance sheet, statement of cost of goods manufactured, and income statement.

**Key Points** The financial statements of manufacturing companies differ from those of merchandising companies. Manufacturing company balance sheets report three types of inventory: materials, work in process, and finished goods. The income statement of manufacturing companies reports the cost of goods sold, which is the total manufacturing cost of the goods sold. The income statement is supported by the statement of cost of goods manufactured, which provides the details of the cost of goods manufactured during the period.

Learning Outcomes	Example Exercises	Practice Exercises	
Describe materials inventory.		Exercises	
• Describe work in process inventory.			
• Describe finished goods inventory.			
<ul> <li>Describe the differences between merchandising and manufacturing company balance sheets.</li> </ul>			
• Prepare a statement of cost of goods manufactured.	EE16-5	PE16-5A, 16-5B	
<ul> <li>Prepare an income statement for a manufacturing company.</li> </ul>	EE16-5	PE16-5A, 16-5B	



#### Describe the uses of managerial accounting information.

**Key Points** Managers need information to guide their decision making. Managerial accounting provides a variety of information and reports that help managers run the operations of their business.

Learning Outcome	Example Exercises	Practice Exercises
<ul> <li>Describe examples of how managerial accounting aids managers in decision making.</li> </ul>		

### **Key Terms**

continuous process improvement (758) controller (756) controlling (757) conversion costs (762) cost (759) cost object (759) cost of finished goods available for sale (766) cost of goods manufactured (766) cost of goods sold (766) cost of merchandise sold (766) decision making (758) direct costs (759) direct labor cost (761)

direct materials cost (760) directing (757) factory burden (761) factory overhead cost (761) feedback (757) financial accounting (755) finished goods inventory (765) indirect costs (759) line department (756) management by exception (757) management process (757) managerial accounting (755) manufacturing overhead (761) materials inventory (764) merchandise available for sale (766)
objectives (goals) (757)
operational planning (757)
period costs (762)
planning (757)
prime costs (762)
product costs (762)
staff department (756)
statement of cost of goods
manufactured (766)
strategic planning (757)
strategies (757)
work in process inventory (764)

## **Illustrative Problem**

The following is a list of costs that were incurred in producing this textbook:

- a. Insurance on the factory building and equipment
- b. Salary of the vice president of finance
- c. Hourly wages of printing press operators during production
- d. Straight-line depreciation on the printing presses used to manufacture the text
- e. Electricity used to run the presses during the printing of the text
- f. Sales commissions paid to textbook representatives for each text sold
- g. Paper on which the text is printed
- h. Book covers used to bind the pages
- i. Straight-line depreciation on an office building
- j. Salaries of staff used to develop artwork for the text
- k. Glue used to bind pages to cover

#### **Instructions**

With respect to the manufacture and sale of this text, classify each cost as either a product cost or a period cost. Indicate whether each product cost is a direct materials cost, a direct labor cost, or a factory overhead cost. Indicate whether each period cost is a selling expense or an administrative expense.

#### Solution

	Product Cost		Pe	riod Cost	
	<b>Direct Materials</b>	<b>Direct Labor</b>	<b>Factory Overhead</b>	Selling	Administrative
Cost	Cost	Cost	Cost	Expense	Expense
a.			Χ		
b.					X
c.		Χ			
d.			Χ		
e.			Χ		
f.				X	
g.	Χ				
h.	Χ				
i.					Χ
j.			Χ		
k.			Χ		

### **Discussion Questions**

- 1. What are the major differences between managerial accounting and financial accounting?
- 2. a. Differentiate between a department with line responsibility and a department with staff responsibility.
  - b. In an organization that has a Sales Department and a Personnel Department, among others, which of the two departments has (1) line responsibility and (2) staff responsibility?
- 3. What manufacturing cost term is used to describe the cost of materials that are an integral part of the manufactured end product?
- 4. Distinguish between prime costs and conversion
- 5. What is the difference between a product cost and a period cost?

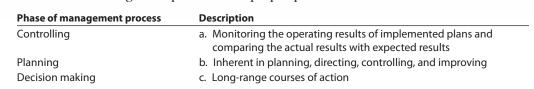
- 6. Name the three inventory accounts for a manufacturing business, and describe what each balance represents at the end of an accounting pe-
- 7. In what order should the three inventories of a manufacturing business be presented on the balance sheet?
- 8. What are the three categories of manufacturing costs included in the cost of finished goods and the cost of work in process?
- 9. For a manufacturer, what is the description of the account that is comparable to a merchandising business's cost of merchandise sold?
- 10. How does the Cost of Goods Sold section of the income statement differ between merchandising and manufacturing companies?

### **Practice Exercises**

#### EE 16-1 p. 758 PE 16-1A Management process

OBJ. 1

Three phases of the management process are controlling, planning, and decision making. Match the following descriptions to the proper phase:





#### EE 16-1 p. 758 PE 16-1B Management process

OBJ. 1



Three phases of the management process are planning, directing, and controlling. Match the following descriptions to the proper phase:

Phase of management process	Description
Planning	a. Developing long-range courses of action to achieve goals.
Directing	<ul> <li>Isolating significant departures from plans for further investigation and possible remedial action. It may lead to a revision of future plans.</li> </ul>
Controlling	<ul> <li>Process by which managers, given their assigned levels of responsibilities, run day-to-day operations.</li> </ul>

#### EE 16-2 p. 761 PE 16-2A Direct materials, direct labor, and factory overhead

OBJ. 2



Identify the following costs as direct materials (DM), direct labor (DL), or factory overhead (FO) for an automobile manufacturer:

- a. Wages of employees that operate painting equipment
- b. Wages of the plant supervisor
- c. Steel
- d. Oil used for assembly line machinery

#### EE 16-2 p. 761 PE 16-2B Direct materials, direct labor, and factory overhead

OBJ. 2

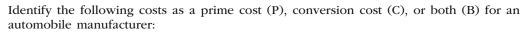


Identify the following costs as direct materials (DM), direct labor (DL), or factory overhead (FO) for a magazine publisher:

- a. Staples used to bind magazines
- b. Wages of printing machine employees
- c. Maintenance on printing machines
- d. Paper used in the magazine

#### EE 16-3 p. 762 PE 16-3A Prime and conversion costs

OBJ. 2



- a. Wages of employees that operate painting equipment
- b. Wages of the plant manager
- c. Steel
- d. Oil used for assembly line machinery

#### EE 16-3 p. 762 PE 16-3B Prime and conversion costs

OBJ. 2



Identify the following costs as a prime cost (P), conversion cost (C), or both (B) for a magazine publisher:

- a. Paper used for the magazine
- b. Wages of printing machine employees
- c. Glue used to bind magazine
- d. Maintenance on printing machines

#### EE 16-4 p. 764 PE 16-4A Product and period costs

OBJ. 2



Identify the following costs as a product cost or a period cost for an automobile manufacturer:

- a. Steel
- b. Wages of employees that operate painting equipment
- c. Rent on office building
- d. Sales staff salaries

#### EE 16-4 p. 764 PE 16-4B Product and period costs

OBJ. 2

Identify the following costs as a product cost or a period cost for a magazine publisher:

- a. Sales salaries
  - b. Paper used for the magazine
  - c. Maintenance on printing machines
  - d. Depreciation expense—corporate headquarters

#### EE 16-5 p. 769 PE 16-5A Cost of goods sold, cost of goods manufactured

OBJ. 3

Timbuk 3 Company has the following information for March:

Cost of direct materials used in production	\$21,000
Direct labor	54,250
Factory overhead	35,000
Work in process inventory, March 1	87,500
Work in process inventory, March 31	92,750
Finished goods inventory, March 1	36,750
Finished goods inventory, March 31	42,000

For March, determine (a) the cost of goods manufactured and (b) the cost of goods sold.

#### EE 16-5 p. 769 PE 16-5B Cost of goods sold, cost of goods manufactured

OBJ. 3

Ebony Company has the following information for July:



ME HOW

Cost of direct materials used in production	\$67,200
Direct labor	88,000
Factory overhead	44,800
Work in process inventory, July 1	32,800
Work in process inventory, July 31	29,600
Finished goods inventory, July 1	37,600
Finished goods inventory, July 31	27,200

For July, determine (a) the cost of goods manufactured and (b) the cost of goods sold.

### Exercises

#### EX 16-1 Classifying costs as materials, labor, or factory overhead

OBJ. 2

Indicate whether each of the following costs of an automobile manufacturer would be classified as direct materials cost, direct labor cost, or factory overhead cost:

- a. Depreciation of robotic assembly line equipment
- b. V8 automobile engine
- c. Steering wheel
- d. Wheels
- e. Painting safety masks for employees working in the paint room
- Salary of test driver
- Glass used in the vehicle's windshield
- h. Wages of assembly line worker



#### EX 16-2 Classifying costs as materials, labor, or factory overhead

OBJ. 2

Indicate whether the following costs of Procter & Gamble, a maker of consumer products, would be classified as direct materials cost, direct labor cost, or factory overhead cost:

- a. Plant manager salary for the Iowa City, Iowa, plant
- b. Maintenance supplies
- c. Salary of process engineers
- d. Wages paid to Packaging Department employees in the Bear River City, Utah, paper products plant
- e. Scents and fragrances used in making soaps and detergents
- f. Wages of production line employees at the Pineville, Louisiana, soap and detergent plant
- g. Depreciation on assembly line in the Mehoopany, Pennsylvania, paper products plant
- h. Packaging materials
- i. Resins for body wash products
- j. Depreciation on the Auburn, Maine, manufacturing plant

#### EX 16-3 Classifying costs as factory overhead

OBJ. 2

Which of the following items are properly classified as part of factory overhead for Ford Motor Company, a maker of heavy automobiles and trucks?

- a. Plant manager's salary at Buffalo, New York, stamping plant, which manufactures auto and truck subassemblies
- b. Depreciation on Flat Rock, Michigan, assembly plant
- c. Dividends paid to shareholders
- d. Machine lubricant used to maintain the assembly line at the Louisville, Kentucky, assembly plant
- e. Leather to be used on vehicles that have leather interiors
- f. Depreciation on mechanical robots used on the assembly line
- g. Consultant fees for a study of production line efficiency
- h. Dealership sales incentives
- i. Vice president of human resources's salary
- j. Property taxes on the Detriot, Michigan, headquarters building



#### EX 16-4 Classifying costs as product or period costs

OBJ. 2

For apparel manufacturer Abercrombie & Fitch, Inc., classify each of the following costs as either a product cost or a period cost:

- a. Research and development costs
- b. Depreciation on sewing machines
- c. Fabric used during production
- d. Depreciation on office equipment
- e. Advertising expenses
- f. Repairs and maintenance costs for sewing machines
- g. Salary of production quality control supervisor
- h. Utility costs for office building
- i. Sales commissions
- j. Salaries of distribution center personnel
- k. Wages of sewing machine operators
- l. Factory janitorial supplies
- m. Chief financial officer's salary
- n. Travel costs of media relations employees
- o. Factory supervisors' salaries
- p. Oil used to lubricate sewing machines
- q. Property taxes on factory building and equipment

#### EX 16-5 Concepts and terminology

**OBJ. 1, 2** 

From the choices presented in parentheses, choose the appropriate term for completing each of the following sentences:

- a. Advertising costs are usually viewed as (period, product) costs.
- b. Feedback is often used to (improve, direct) operations.
- c. Payments of cash or the commitment to pay cash in the future for the purpose of generating revenues are (costs, expenses).
- d. A product, sales territory, department, or activity to which costs are traced is called a (direct cost, cost object).
- e. The balance sheet of a manufacturer would include an account for (cost of goods sold, work in process inventory).
- f. Factory overhead costs combined with direct labor costs are called (prime, conversion) costs.
- g. The implementation of automatic, robotic factory equipment normally (increases, decreases) the direct labor component of product costs.

#### EX 16-6 Concepts and terminology

OBJ. 1, 2

From the choices presented in parentheses, choose the appropriate term for completing each of the following sentences:

- a. The phase of the management process that uses process information to eliminate the source of problems in a process so that the process delivers the correct product in the correct quantities is called (directing, improving).
- b. Direct labor costs combined with factory overhead costs are called (prime, conversion) costs.
- c. The salaries of sales people are normally considered a (period, product) cost.
- d. The plant manager's salary would be considered (direct, indirect) to the product.
- e. Long-term plans are called (strategic, operational) plans.
- f. Materials for use in production are called (supplies, materials inventory).
- g. An example of factory overhead is (electricity used to run assembly line, CEO salary).

#### EX 16-7 Classifying costs in a service company

OBJ. 2

A partial list of the costs for Wisconsin and Minnesota Railroad, a short hauler of freight, follows. Classify each cost as either indirect or direct. For purposes of classifying each cost, use the train as the cost object.

- a. Cost to lease (rent) railroad cars
- b. Cost of track and bed (ballast) replacement
- c. Diesel fuel costs
- d. Cost to lease (rent) train locomotives
- e. Depreciation of terminal facilities
- f. Maintenance costs of right of way, bridges, and buildings
- g. Salaries of dispatching and communications personnel
- h. Headquarters information technology support staff salaries
- i. Safety training costs
- j. Wages of train engineers
- k. Wages of switch and classification yard personnel
- 1. Costs of accident cleanup



#### EX 16-8 Classifying costs

**OBJ. 2, 3** 

The following report was prepared for evaluating the performance of the plant manager of Marching Ants Inc. Evaluate and correct this report.

#### Marching Ants Inc. Manufacturing Costs For the Quarter Ended June 30, 2016

Materials used in production (including \$56,200 of indirect materials)	\$	607,500
•	~	,
Direct labor (including \$84,400 maintenance salaries)		562,500
Factory overhead:		
Supervisor salaries		517,500
Heat, light, and power		140,650
Sales salaries		348,750
Promotional expenses		315,000
Insurance and property taxes—plant		151,900
Insurance and property taxes—corporate offices		219,400
Depreciation—plant and equipment		123,750
Depreciation—corporate offices		90,000
Total	\$3	,076,950

#### EX 16-9 Financial statements of a manufacturing firm

OBJ. 3

The following events took place for Video Wave Manufacturing Company during January 2016, the first month of its operations as a producer of digital video monitors:

- a. Purchased \$133,200 of materials.
- b. Used \$94,080 of direct materials in production.
- c. Incurred \$180,320 of direct labor wages.
- d. Incurred \$211,680 of factory overhead.
- e. Transferred \$425,320 of work in process to finished goods.
- f. Sold goods with a cost of \$365,000.
- g. Earned revenues of \$652,000.
- h. Incurred \$86,520 of selling expense.
- i. Incurred \$71,250 of administrative expense.

Using the information given, complete the following:

- a. Prepare the January 2016 income statement for Video Wave Manufacturing Company.
- b. Determine the inventory balances at the end of the first month of operations.

#### EX 16-10 Manufacturing company balance sheet

OBJ. 3

Partial balance sheet data for Flat Top Company at December 31, 2016, are as follows:

Finished goods inventory	\$ 40,250	Supplies	\$ 71,300
Prepaid insurance	27,500	Materials inventory	87,500
Accounts receivable	105,000	Cash	112,000
Work in process inventory	157,500		

Prepare the Current Assets section of Flat Top Company's balance sheet at December 31, 2016.

#### EX 16-11 Cost of direct materials used in production for a manufacturing company OBJ. 3

Rextacular Manufacturing Company reported the following materials data for the month ending June 30, 2016:

Materials purchased	\$828,000
Materials inventory, June 1	279,000
Materials inventory, June 30	252,000

Determine the cost of direct materials used in production by Rextacular during the month ended June 30, 2016.

✓ a. Net income, \$129,230







#### EX 16-12 Cost of goods manufactured for a manufacturing company

OBJ. 3

Two items are omitted from each of the following three lists of cost of goods manufactured statement data. Determine the amounts of the missing items, identifying them by letter.

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Work in process inventory, August 1	\$ 22,400	\$ 50,400	(e)
Total manufacturing costs incurred during August	156,800	(c)	58,800
Total manufacturing costs	(a)	\$294,000	\$68,600
Work in process inventory, August 31	33,600	67,200	(f)
Cost of goods manufactured	(b)	(d)	\$60,200

#### EX 16-13 Cost of goods manufactured for a manufacturing company

OBJ. 3

The following information is available for Ethtridge Manufacturing Company for the month ending January 31, 2016:

Cost of direct materials used in production	\$390,000
Direct labor	336,000
Work in process inventory, January 1	162,000
Work in process inventory, January 31	170,400
Total factory overhead	234,000

Determine Ethtridge's cost of goods manufactured for the month ended January 31, 2016.

#### EX 16-14 Income statement for a manufacturing company

OBJ. 3

Two items are omitted from each of the following three lists of cost of goods sold data from a manufacturing company income statement. Determine the amounts of the missing items, identifying them by letter.

Finished goods inventory, June 1	\$ 61,600	\$ 46,200	(e)
Cost of goods manufactured	329,000	(c)	484,800
Cost of finished goods available for sale	(a)	\$260,400	\$540,000
Finished goods inventory, June 30	72,800	61,600	(f)
Cost of goods sold	(b)	(d)	\$513,600

✓ a. Total manufacturing costs,

✓ d. \$198,800



\$1,568,160

✓ e. \$9,800



### EX 16-15 Statement of cost of goods manufactured for a manufacturing company OBJ. 3

Cost data for Mix-A-Lot Manufacturing Company for the month ended March 31, 2016, are as follows:

Inventories	March 1	March 31
Materials	\$315,000	\$277,200
Work in process	214,200	239,400
Finished goods	163,800	189,000
Direct labor		\$567,000
Materials purchased during May		604,800
Factory overhead incu	ırred during May:	
Indirect labor		60,480
Machinery depreciation		36,000
Heat, light, and power		12,600
Supplies		10,080
Property taxes		8,820
Miscellaneous costs	5	16,380

- a. Prepare a cost of goods manufactured statement for March 2016.
- b. Determine the cost of goods sold for March 2016.

## **EX 16-16** Cost of goods sold, profit margin, and net income for a manufacturing **OBJ. 3** company

✓ a. Cost of goods sold, \$457,450



√a. \$330,000

The following information is available for Crouching Alligator Manufacturing Company for the month ending October 31, 2016:

Cost of goods manufactured	\$450,000
Selling expenses	144,500
Administrative expenses	75,900
Sales	911,250
Finished goods inventory, July 1	101,250
Finished goods inventory, July 31	93,800

For the month ended October 31, 2016, determine Crouching Alligator's (a) cost of goods sold, (b) gross profit, and (c) net income.

#### EX 16-17 Cost flow relationships

OBJ. 3

The following information is available for the first month of operations of Bahadir Company, a manufacturer of mechanical pencils:

Sales	\$792,000
Gross profit	462,000
Cost of goods manufactured	396,000
Indirect labor	171,600
Factory depreciation	26,400
Materials purchased	244,200
Total manufacturing costs for the period	455,400
Materials inventory, ending	33,000

Using the information given, determine the following missing amounts:

- a. Cost of goods sold
- b. Finished goods inventory at the end of the month
- c. Direct materials cost
- d. Direct labor cost
- e. Work in process inventory at the end of the month





#### EX 16-18 Uses of managerial accounting in a service company

**Priceline.com** allows customers to bid on hotel rooms by "naming their price." This "name your price" process allows customers to obtain a better rate on a hotel room than they might be able to obtain by reserving their room directly from the hotel. The hotel can also benefit from this transaction by filling empty hotel rooms during periods of low occupancy.

Natalie Mooney bids \$85 for a night's stay at the Hotel Monaco in Seattle on Saturday August 10. The Hotel Monaco is not fully booked that evening and would likely accept any reasonable bids. How might the Hotel Monaco use managerial accounting information to decide whether or not to accept Natalie's bid?

### **Problems: Series A**

#### PR 16-1A Classifying costs

OBJ. 2

The following is a list of costs that were incurred in the production and sale of large commercial airplanes:

- a. Salary of chief compliance officer of company
- b. Power used by painting equipment
- c. Instrument panel installed in the airplane cockpit
- d. Annual bonus paid to the chief operating officer of the company
- e. Turbo-charged airplane engine
- f. Interior trim material used throughout the airplane cabin

- g. Cost of normal scrap from production of airplane body
- h. Hourly wages of employees that assemble the airplane
- i. Salary of the marketing department personnel
- j. Cost of paving the headquarters employee parking lot
- k. Cost of electrical wiring throughout the airplane
- 1. Cost of electronic guidance system installed in the airplane cockpit
- m. Salary of plant manager
- n. Cost of miniature replicas of the airplane used to promote and market the airplane
- o. Human resources department costs for the year
- p. Metal used for producing the airplane body
- q. Annual fee to a celebrity to promote the aircraft
- r. Hydraulic pumps used in the airplane's flight control system
- s. Yearly cost of the maintenance contract for robotic equipment
- t. Prebuilt leather seats installed in the first-class cabin
- u. Depreciation on factory equipment
- v. Special advertising campaign in Aviation World magazine
- w. Oil to lubricate factory equipment
- x. Masks for use by painters in painting the airplane body
- y. Decals for cockpit door, the cost of which is immaterial to the cost of the final product
- z. Salary of chief financial officer

#### **Instructions**

Classify each cost as either a product cost or a period cost. Indicate whether each product cost is a direct materials cost, a direct labor cost, or a factory overhead cost. Indicate whether each period cost is a selling expense or an administrative expense. Use the following tabular headings for your answer, placing an "X" in the appropriate column:

	Product Costs		Pe	riod Costs	
Cost	Direct Materials Cost	Direct Labor Cost	Factory Overhead Cost	Selling Expense	Administrative Expense

#### PR 16-2A Classifying costs

OBJ. 2

The following is a list of costs incurred by several businesses:

- a. Cost of fabric used by clothing manufacturer
- b. Maintenance and repair costs for factory equipment
- c. Rent for a warehouse used to store work in process and finished products
- d. Wages of production quality control personnel
- e. Oil lubricants for factory plant and equipment
- f. Depreciation of robot used to assemble a product
- g. Travel costs of marketing executives to annual sales meeting
- h. Depreciation of copying machines used by the Marketing Department
- i. Fees charged by collection agency on past-due customer accounts
- j. Electricity used to operate factory machinery
- k. Maintenance costs for factory equipment
- l. Pens, paper, and other supplies used by the Accounting Department in preparing various managerial reports
- m. Charitable contribution to United Fund
- n. Depreciation of microcomputers used in the factory to coordinate and monitor the production schedules
- o. Fees paid to lawn service for office grounds upkeep

(Continued)

- p. Cost of sewing machine needles used by a shirt manufacturer
- q. Cost of plastic for a telephone being manufactured
- r. Telephone charges by president's office
- s. Cost of 30-second television commercial
- t. Surgeon's fee for heart bypass surgery
- u. Depreciation of tools used in production
- v. Wages of a machine operator on the production line
- w. Salary of the vice president of manufacturing operations
- x. Factory janitorial supplies

#### **Instructions**

Classify each of the preceding costs as a product cost or period cost. Indicate whether each product cost is a direct materials cost, a direct labor cost, or a factory overhead cost. Indicate whether each period cost is a selling expense or an administrative expense. Use the following tabular headings for preparing your answer, placing an "X" in the appropriate column:

	F	Product Costs		Period Costs	
Cost	Direct Materials Cost	Direct Labor Cost	Factory Overhead Cost	Selling Expense	Administrative Expense



#### PR 16-3A Cost classifications for a service company

OBJ. 2

A partial list of Foothills Medical Center's costs follows:

- a. Cost of patient meals
- b. Nurses' salaries
- c. Depreciation of X-ray equipment
- d. Utility costs of the hospital
- e. Salary of intensive care personnel
- f. Cost of X-ray test
- g. Operating room supplies used on patients (catheters, sutures, etc.)
- h. Salary of the nutritionist
- i. General maintenance of the hospital
- j. Cost of new heart wing
- k. Cost of drugs used for patients
- l. Cost of advertising hospital services on television
- m. Cost of improvements on the employee parking lot
- n. Cost of intravenous solutions used for patients
- o. Training costs for nurses
- p. Cost of laundry services for operating room personnel
- q. Doctor's fee
- r. Overtime incurred in the Patient Records Department due to a computer failure
- s. Cost of blood tests
- t. Cost of maintaining the staff and visitors' cafeteria
- u. Depreciation on patient rooms

#### **Instructions**

- 1. What would be Foothills Medical Center's most logical definition for the final cost object?
- 2. Identify whether each of the costs is to be classified as direct or indirect. For purposes of classifying each cost as direct or indirect, use the patient as the cost object.

## PR 16-4A Manufacturing income statement, statement of cost of goods oBJ. 2, 3 manufactured

Several items are omitted from the income statement and cost of goods manufactured statement data for two different companies for the month of December 2016:

	Prius Company	Volt Company
Materials inventory, December 1	\$ 280,280	\$ 177,000
Materials inventory, December 31	(a)	180,000
Materials purchased	712,800	342,000
Cost of direct materials used in production	752,400	(a)
Direct labor	1,058,400	(b)
Factory overhead	327,600	180,000
Total manufacturing costs incurred during December	(b)	1,035,000
Total manufacturing costs	2,678,400	1,477,500
Work in process inventory, December 1	540,000	442,500
Work in process inventory, December 31	453,600	(c)
Cost of goods manufactured	(c)	1,024,500
Finished goods inventory, December 1	475,200	204,000
Finished goods inventory, December 31	496,800	(d)
Sales	4,140,000	1,675,500
Cost of goods sold	(d)	1,051,500
Gross profit	(e)	(e)
Operating expenses	540,000	(f)
Net income	(f)	384,000

#### **Instructions**

- 1. Determine the amounts of the missing items, identifying them by letter.
- 2. Prepare Volt Company's statement of cost of goods manufactured for December.
- 3. Prepare Volt Company's income statement for December.

## PR 16-5A Statement of cost of goods manufactured and income statement for a OBJ. 2, 3 manufacturing company

The following information is available for The NewQuest Corporation for 2016:

Inventories	January 1	December 31
Materials	\$351,000	\$436,800
Work in process	631,800	592,800
Finished goods	608,400	576,000
Advertising expense		\$ 296,400
Depreciation expense	—office equipment	42,120
Depreciation expense	—factory equipment	56,160
Direct labor		670,800
Heat, light, and power	r—factory	22,460
Indirect labor		78,750
Materials purchased		659,800
Office salaries expens	e	185,000
Property taxes—facto	ry	18,500
Property taxes—office	e building	32,400
Rent expense—factor	у	32,000
Sales		3,010,000
Sales salaries expense		420,000
Supplies—factory		15,400
Miscellaneous costs—	-factory	9,500

#### **Instructions**

- 1. Prepare the 2016 statement of cost of goods manufactured.
- 2. Prepare the 2016 income statement.





✓ 1. Cost of goods manufactured, \$1,516,570





### **Problems: Series B**

#### PR 16-1B Classifying costs

OBJ. 2

The following is a list of costs that were incurred in the production and sale of lawn mowers:

- a. Premiums on insurance policy for factory buildings
- b. Tires for lawn mowers
- c. Filter for spray gun used to paint the lawn mowers
- d. Paint used to coat the lawn mowers, the cost of which is immaterial to the cost of the final product
- e. Plastic for outside housing of lawn mowers
- f. Salary of factory supervisor
- g. Hourly wages of operators of robotic machinery used in production
- h. Engine oil used in mower engines prior to shipment
- i. Salary of vice president of marketing
- j. Property taxes on the factory building and equipment
- k. Cost of advertising in a national magazine
- 1. Gasoline engines used for lawn mowers
- m. Electricity used to run the robotic machinery
- n. Straight-line depreciation on the robotic machinery used to manufacture the lawn mowers
- o. Salary of quality control supervisor who inspects each lawn mower before it is shipped
- p. Attorney fees for drafting a new lease for headquarters offices
- q. Payroll taxes on hourly assembly line employees
- r. Telephone charges for company controller's office
- s. Steering wheels for lawn mowers
- t. Factory cafeteria cashier's wages
- u. Cash paid to outside firm for janitorial services for factory
- v. Maintenance costs for new robotic factory equipment, based on hours of usage
- w. Cost of boxes used in packaging lawn mowers
- x. License fees for use of patent for lawn mower blade, based on the number of lawn mowers produced
- y. Steel used in producing the lawn mowers
- z. Commissions paid to sales representatives, based on the number of lawn mowers sold

#### Instructions

Classify each cost as either a product cost or a period cost. Indicate whether each product cost is a direct materials cost, a direct labor cost, or a factory overhead cost. Indicate whether each period cost is a selling expense or an administrative expense. Use the following tabular headings for your answer, placing an "X" in the appropriate column:

	<b>Product Costs</b>		Pe	riod Costs	
Cost	Direct Materials Cost	Direct Labor Cost	Factory Overhead Cost	Selling Expense	Administrative Expense

#### PR 16-2B Classifying costs

OBJ. 2

The following is a list of costs incurred by several businesses:

- a. Salary of quality control supervisor
- b. Packing supplies for products sold. These supplies are a very small portion of the total cost of the product.
- c. Factory operating supplies
- d. Depreciation of factory equipment
- e. Hourly wages of warehouse laborers
- f. Wages of company controller's secretary
- g. Maintenance and repair costs for factory equipment
- h. Paper used by commercial printer
- i. Entertainment expenses for sales representatives
- j. Protective glasses for factory machine operators
- k. Sales commissions
- 1. Cost of hogs for meat processor
- m. Cost of telephone operators for a toll-free hotline to help customers operate products
- n. Hard drives for a microcomputer manufacturer
- o. Lumber used by furniture manufacturer
- p. Wages of a machine operator on the production line
- q. First-aid supplies for factory workers
- r. Tires for an automobile manufacturer
- s. Paper used by Computer Department in processing various managerial reports
- t. Seed for grain farmer
- u. Health insurance premiums paid for factory workers
- v. Costs of operating a research laboratory
- w. Costs for television advertisement
- x. Executive bonus for vice president of marketing

#### Instructions

Classify each of the preceding costs as a product cost or period cost. Indicate whether each product cost is a direct materials cost, a direct labor cost, or a factory overhead cost. Indicate whether each period cost is a selling expense or an administrative expense. Use the following tabular headings for preparing your answer. Place an "X" in the appropriate column.

	Product Costs		Pe	riod Costs	
Cost	Direct Materials Cost	Direct Labor Cost	Factory Overhead Cost	Selling Expense	Administrative Expense



#### PR 16-3B Cost classifications for a service company

OBJ. 2

A partial list of The Grand Hotel's costs follows:

- a. Cost to mail a customer survey
- b. Wages of convention setup employees
- c. Pay-per-view movie rental costs (in rooms)
- d. Cost of food
- e. Cost of room mini-bar supplies
- f. Training for hotel restaurant servers
- g. Cost to paint lobby

(Continued)

- h. Cost of laundering towels and bedding
- i. Champagne for guests
- j. Salary of the hotel manager
- k. Depreciation of the hotel
- l. Cost of valet parking
- m. Wages of bellhops
- n. Cost to replace lobby furniture
- o. Cost of advertising in local newspaper
- p. Wages of desk clerks
- q. Wages of maids
- r. Cost of new carpeting
- s. Guest room telephone costs for long-distance calls
- t. Cost of soaps and shampoos for rooms
- u. Utility cost
- v. Wages of kitchen employees
- w. General maintenance supplies

#### **Instructions**

- 1. What would be The Grand Hotel's most logical definition for the final cost object?
- 2. Identify whether each of the costs is to be classified as direct or indirect. For purposes of classifying each cost as direct or indirect, use the hotel guest as the cost object.

## PR 16-4B Manufacturing income statement, statement of cost of goods manufactured

**OBJ. 2, 3** 

Several items are omitted from the income statement and cost of goods manufactured statement data for two different companies for the month of December 2016:

#### ✓1. c. On Company, \$800,800



	On Company	Off Company
Materials inventory, December 1	\$ 65,800	\$ 195,300
Materials inventory, December 31	(a)	91,140
Materials purchased	282,800	(a)
Cost of direct materials used in production	317,800	(b)
Direct labor	387,800	577,220
Factory overhead	148,400	256,060
Total manufacturing costs incurred in December	(b)	1,519,000
Total manufacturing costs	973,000	1,727,320
Work in process inventory, December 1	119,000	208,320
Work in process inventory, December 31	172,200	(c)
Cost of goods manufactured	(c)	1,532,020
Finished goods inventory, December 1	224,000	269,080
Finished goods inventory, December 31	197,400	(d)
Sales	1,127,000	1,944,320
Cost of goods sold	(d)	1,545,040
Gross profit	(e)	(e)
Operating expenses	117,600	(f)
Net income	(f)	164,920

#### **Instructions**

- 1. Determine the amounts of the missing items, identifying them by letter.
- 2. Prepare On Company's statement of cost of goods manufactured for December.
- 3. Prepare On Company's income statement for December.

## PR 16-5B Statement of cost of goods manufactured and income statement for a OBJ. 2, 3 manufacturing company

The following information is available for Shanika Company for 2016:







Inventories	January 1	December 31
Materials	\$ 77,350	\$ 95,550
Work in process	109,200	96,200
Finished goods	113,750	100,100
Advertising expense		\$ 68,250
Depreciation expense	e—office equipment	22,750
Depreciation expense	e—factory equipment	14,560
Direct labor		186,550
Heat, light, and powe	5,850	
Indirect labor		23,660
Materials purchased		123,500
Office salaries expens	se	77,350
Property taxes—facto	ory	4,095
Property taxes—head	dquarters building	13,650
Rent expense—facto	ry	6,825
Sales		864,500
Sales salaries expense	2	136,500
Supplies—factory		3,250
Miscellaneous costs-	-factory	4,420

#### **Instructions**

- 1. Prepare the 2016 statement of cost of goods manufactured.
- 2. Prepare the 2016 income statement.

### **Cases & Projects**



#### CP 16-1 Ethics and professional conduct in business

H. Jeckel Manufacturing Company allows employees to purchase, at cost, manufacturing materials, such as metal and lumber, for personal use. To purchase materials for personal use, an employee must complete a materials requisition form, which must then be approved by the employee's immediate supervisor. Fred Rubble, an assistant cost accountant, charges the employee an amount based on H. Jeckel's net purchase cost.

Fred Rubble is in the process of replacing a deck on his home and has requisitioned lumber for personal use, which has been approved in accordance with company policy. In computing the cost of the lumber, Fred reviewed all the purchase invoices for the past year. He then used the lowest price to compute the amount due the company for the lumber.

Discuss whether Fred behaved in an ethical manner.

#### CP 16-2 Financial versus managerial accounting

The following statement was made by the vice president of finance of The Muppet Company: "The managers of a company should use the same information as the shareholders of the firm. When managers use the same information in guiding their internal operations as shareholders use in evaluating their investments, the managers will be aligned with the stockholders' profit objectives."

Respond to the vice president's statement.

#### CP 16-3 Managerial accounting in the management process

For each of the following managers, describe how managerial accounting could be used to satisfy strategic or operational objectives:

- 1. The vice president of the Information Systems Division of a bank.
- 2. A hospital administrator.
- 3. The chief executive officer of a food company. The food company is divided into three divisions: Nonalcoholic Beverages, Snack Foods, and Fast Food Restaurants.
- 4. The manager of the local campus copy shop.

#### CP 16-4 Classifying costs

Geek Chic Company provides computer repair services for the community. Obie Won's computer was not working, and he called Geek Chic for a home repair visit. Geek Chic Company's technician arrived at 2:00 P.M. to begin work. By 4:00 P.M. the problem was diagnosed as a failed circuit board. Unfortunately, the technician did not have a new circuit board in the truck because the technician's previous customer had the same problem, and a board was used on that visit. Replacement boards were available back at Geek Chic Company's shop. Therefore, the technician drove back to the shop to retrieve a replacement board. From 4:00 to 5:00 P.M., Geek Chic Company's technician drove the round trip to retrieve the replacement board from the shop.

At 5:00 P.M. the technician was back on the job at Obie's home. The replacement procedure is somewhat complex because a variety of tests must be performed once the board is installed. The job was completed at 6:00 P.M.

Obie's repair bill showed the following:

Circuit board	\$100
Labor charges	300
Total	\$400

Obie was surprised at the size of the bill and asked for some greater detail supporting the calculations. Geek Chic Company responded with the following explanations:

Cost of materials:

Purchase price of circuit board	\$	80
Markup on purchase price to cover storage and handling		20
Total materials charge	\$1	00

The labor charge per hour is detailed as follows:

2:00-3:00 P.M.	\$ 70
3:00-4:00 P.M.	60
4:00-5:00 P.M.	80
5:00-6:00 P.M.	90
Total labor charge	\$300

Further explanations in the differences in the hourly rates are as follows:

#### First hour:

Base labor rate	\$42
Fringe benefits	10
Overhead (other than storage and handling)	_ 8
Total base labor rate	<del>8</del> \$60
Additional charge for first hour of any job to cover the cost of vehicle depreciation, fuel, and employee time in	
transit. A 30-minute transit time is assumed	10 \$70
	\$70

Third hour:	
Base labor rate	\$60
The trip back to the shop includes vehicle depreciation and fuel; therefore, a charge was added to the hourly rate	
to cover these costs. The round trip took an hour	_20
	\$80
Fourth hour:	
Base labor rate	\$60
Overtime premium for time worked in excess of an eight-	
hour day (starting at 5:00 P.M.) is equal to 1.5 times the base	
rate	_30
	\$90

- 1. If you were in Obie's position, how would you respond to the bill? Are there parts of the bill that appear incorrect to you? If so, what argument would you employ to convince Geek Chic Company that the bill is too high?
- 2. Use the headings that follow to construct a table. Fill in the table by first listing the costs identified in the activity in the left-hand column. For each cost, place a check mark in the appropriate column identifying the correct cost classification. Assume that each service call is a job.

Cost	<b>Direct Materials</b>	Direct Labor	Overhead

#### CP 16-5 Using managerial accounting information

The following situations describe decision scenarios that could use managerial accounting information:

- 1. The manager of High Times Restaurant wishes to determine the price to charge for various lunch plates.
- 2. By evaluating the cost of leftover materials, the plant manager of a precision tool facility wishes to determine how effectively the plant is being run.
- 3. The division controller of West Coast Supplies needs to determine the cost of products left in inventory.
- 4. The manager of the Maintenance Department of a large manufacturing company wishes to plan next year's anticipated expenditures.
- For each situation, discuss how managerial accounting information could be used.

#### CP 16-6 Classifying costs

#### **Group Project**

With a group of students, visit a local copy and graphics shop or a pizza restaurant. As you observe the operation, consider the costs associated with running the business. As a group, identify as many costs as you can and classify them according to the following table headings:

Cost	Direct Materials	Direct Labor	Overhead	Selling Expenses



# **Job Order Costing**

# Paul Stanley's Guitar

s we discussed in Chapter 16, Paul Stanley of the legendary rock band KISS uses a custom-made guitar built by Washburn Guitars. In fact, Paul Stanley designed his guitar in partnership with Washburn Guitars, as have other rock stars like Dan Donnegan of the rock band Disturbed. Washburn's guitars are precision instruments that require high-quality materials and careful craftsmanship. As a result, amateurs and professionals are willing to pay between \$1,100 and \$10,000 for a PS (Paul Stanley) Series guitar. In order for Washburn to stay in business, the purchase price of the guitar must be greater than the cost of producing the guitar. So, how does Washburn determine the cost of producing a guitar?

Costs associated with creating a guitar include materials such as wood and strings, the wages of employees who build the

guitar, and factory overhead. To determine the purchase price of Paul Stanley's guitar, Washburn identifies and records the costs that go into the guitar during each step of the manufacturing process. As the guitar moves through the production process, the costs of direct materials, direct labor, and factory overhead are recorded. When the guitar is complete, the costs that have been recorded are added up to determine the cost of Paul Stanley's unique guitar. The company then prices the guitar to achieve a level of profit greater than the cost of the guitar. This chapter introduces the principles of accounting systems that accumulate costs in the same manner as they were for Paul Stanley's guitar.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe cost accounting systems used by manufacturing businesses.  Cost Accounting Systems Overview	
Describe and illustrate a job order cost accounting system. Job Order Cost Systems for Manufacturing Businesses Materials Factory Labor Factory Overhead Work in Process Finished Goods Sales and Cost of Goods Sold Period Costs Summary of Cost Flows for Legend Guitars	EE 17-1 EE 17-2 EE 17-3, 17-4 EE 17-5
Describe the use of job order cost information for decision making.  Job Order Costing for Decision Making	
Describe the flow of costs for a service business that uses a job order cost accounting system  Job Order Cost Systems for Professional Service Businesses	
At a Glan	rage 808



### **Cost Accounting Systems Overview**

**Cost accounting systems** measure, record, and report product costs. Managers use product costs for setting product prices, controlling operations, and developing financial statements.

The two main types of cost accounting systems for manufacturing operations are:

- Job order cost systems
- Process cost systems

A **job order cost system** provides product costs for each quantity of product that is manufactured. Each quantity of product that is manufactured is called a *job*. Job order cost systems are often used by companies that manufacture custom products for customers or batches of similar products. Manufacturers that use a job order cost system are sometimes called *job shops*. An example of a job shop would be an apparel manufacturer, such as Levi Strauss & Co., or a guitar manufacturer, such as Washburn Guitars.

A **process cost system** provides product costs for each manufacturing department or process. Process cost systems are often used by companies that manufacture units of a product that are indistinguishable from each other and are manufactured using a continuous production process. Examples would be oil refineries, paper producers, chemical processors, and food processors.

Job order and process cost systems are widely used. A company may use a job order cost system for some of its products and a process cost system for other products.

The process cost system is illustrated in Chapter 18. The job order cost system is illustrated in this chapter. As a basis for illustration, **Legend Guitars**, a manufacturer of guitars, is used. Exhibit 1 provides a summary of Legend Guitars' manufacturing operations, which were described in Chapter 16.

Warner Bros. and other movie studios use

job order cost systems to accumulate movie production and distribution costs. Costs such as actor salaries, production costs, movie print costs, and marketing costs are accumulated in a job account for a particular movie.

Cutting	Employees cut the body and neck of the guitar out of wood.
Assembling	Employees assemble and finish the guitars.
Product Costs	
Direct materials	The cost of material that is an integral part of and a significant portion of the total cost of the final product. The cost of wood used in the neck and body of the guitars.
Direct labor	The cost of employee wages that are an integral part of and a significant portion of the total cost of the final product. Employee wages for cutting and assembling.
Factory overhead	Costs other than direct materials and direct labor that are incurred in the manufacturing process. The cost of guitar strings, glue, sandpape buffing compound, paint, salaries of production supervisors, janitorial salaries, and factory utilities.
Inventories	
Materials	Includes the cost of direct and indirect materials used to produce the guitars. Direct materials include the cost of wood used in the neck and body of the guitars. Indirect materials include guitar strings, glue, sandpaper, buffing compound, varnish, and paint.
Work in process	Includes the product costs of units that have entered the manufacturing process but have not been completed. For example, the product costs of guitars for which the neck and body have been cut but not yet assembled.
Finished goods	Includes the cost of completed (or finished) products that have not been sold. The product costs assigned to completed guitars that have not yet been sold.

#### **EXHIBIT 1**

Summary of Legend Guitars' Manufacturing Operations

# **Job Order Cost Systems for Manufacturing Businesses**

Describe and illustrate a job order cost accounting system.

A job order cost system records and summarizes manufacturing costs by jobs. The flow of manufacturing costs in a job order system is illustrated in Exhibit 2.

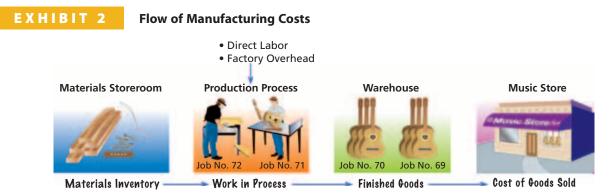
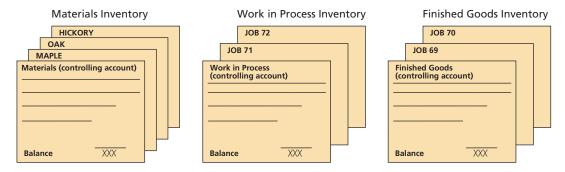


Exhibit 2 indicates that although the materials for Jobs 71 and 72 have been added, both jobs are still in the production process. Thus, Jobs 71 and 72 are part of *Work in Process Inventory*. In contrast, Exhibit 2 indicates that Jobs 69 and 70 have been completed. Thus, Jobs 69 and 70 are part of *Finished Goods Inventory*. Exhibit 2 also indicates that when finished guitars are sold to music stores, their costs become part of *Cost of Goods Sold*.

In a job order cost accounting system, perpetual inventory controlling accounts and subsidiary ledgers are maintained for materials, work in process, and finished goods inventories as shown in Exhibit 3.

#### **EXHIBIT 3**

#### **Inventory Ledger Accounts**

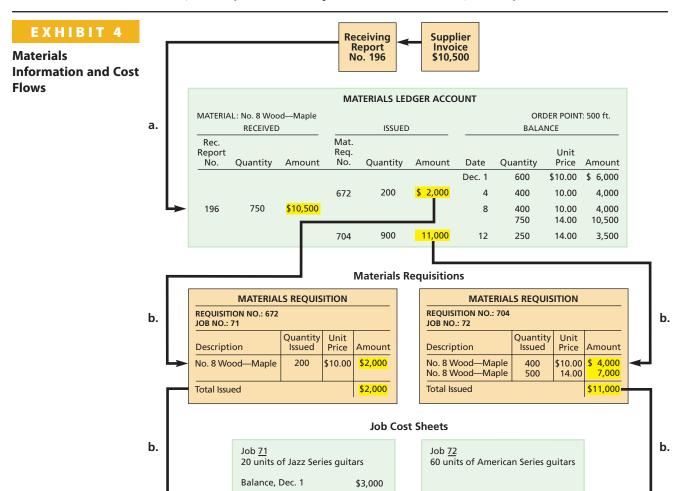


#### **Materials**

The materials account in the general ledger is a controlling account. A separate account for each type of material is maintained in a subsidiary materials ledger.

Exhibit 4 shows **Legend Guitars**' materials ledger account for maple. Increases (debits) and decreases (credits) to the account are as follows:

- Increases (debits) are based on *receiving reports* such as Receiving Report No. 196 for \$10,500, which is supported by the supplier's invoice.
- Decreases (credits) are based on *materials requisitions* such as Requisition No. 672 for \$2,000 for Job 71 and Requisition No. 704 for \$11,000 for Job 72.



2,000

**Direct Materials** 

**Factory Overhead** 

Direct Labor

\$11,000

**Direct Materials** 

**Factory Overhead** 

**Direct Labor** 

A **receiving report** is prepared when materials that have been ordered are received and inspected. The quantity received and the condition of the materials are entered on the receiving report. When the supplier's invoice is received, it is compared to the receiving report. If there are no discrepancies, a journal entry is made to record the purchase. The journal entry to record the supplier's invoice related to Receiving Report No. 196 in Exhibit 4 is as follows:

a. Materials Accounts Payable Materials purchased during December.  10,500
----------------------------------------------------------------------------

The storeroom releases materials for use in manufacturing when a **materials** requisition is received. Examples of materials requisitions are shown in Exhibit 4.

The materials requisitions for each job serve as the basis for recording materials used. For direct materials, the quantities and amounts from the materials requisitions are posted to job cost sheets. **Job cost sheets**, which are also illustrated in Exhibit 4, make up the work in process subsidiary ledger.

Exhibit 4 shows the posting of \$2,000 of direct materials to Job 71 and \$11,000 of direct materials to Job 72. Job 71 is an order for 20 units of Jazz Series guitars, while Job 72 is an order for 60 units of American Series guitars.

A summary of the materials requisitions is used as a basis for the journal entry recording the materials used for the month. For direct materials, this entry increases (debits) Work in Process and decreases (credits) Materials as follows:

	als requisitioned to jobs 0 + \$11,000).	13,000	13,000	
--	---------------------------------------------	--------	--------	--

Many companies use computerized information processes to record the use of materials. In such cases, storeroom employees electronically record the release of materials, which automatically updates the materials ledger and job cost sheets.

# Integrity, Objectivity, and Ethics in Business



#### **PHONY INVOICE SCAMS**

A popular method for defrauding a company is to issue a phony invoice. The scam begins by initially contacting the target firm to discover details of key business contacts, business operations, and products. The swindler then uses this information to create a fictitious invoice.

The invoice will include names, figures, and other details to give it the appearance of legitimacy. This type of scam can be avoided if invoices are matched with receiving documents prior to issuing a check.

¹ To simplify, Exhibit 4 and this chapter use the first-in, first-out cost flow method.

## Example Exercise 17-1 Issuance of Materials



c.

60 units of American Series guitars

**Direct Materials** 

**Factory Overhead** 

**Direct Labor** 

\$11,000

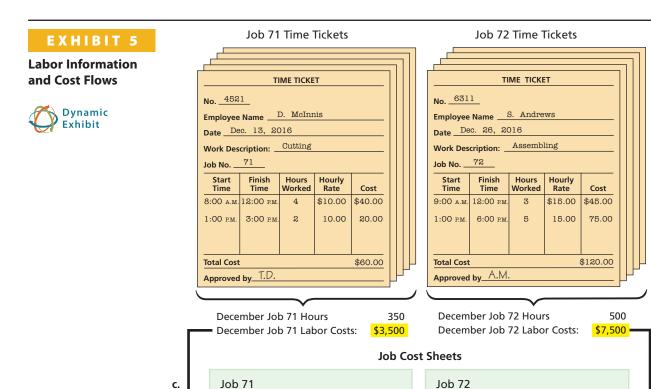
7,500

On March 5, Hatch Company purchased 400 units of raw materials at \$14 per unit. On March 10, raw materials were requisitioned for production as follows: 200 units for Job 101 at \$12 per unit and 300 units for Job 102 at \$14 per unit. Journalize the entry on March 5 to record the purchase and on March 10 to record the requisition from the materials storeroom.

Follow My Ex	cample 17-1	
Mar. 5	Materials	5,600 5,600
10	Work in Process	6,600* 6,600
*Job 101	\$2,400 = 200 × \$12	
Job 102	$4,200 = 300 \times $14$	
Total	\$6,600	
	Practice Exerc	cises: PE 17-1A, PE 17-1B

# **Factory Labor**

When employees report for work, they may use *electronic badges, clock cards*, or *in-and-out cards* to clock in. When employees work on an individual job, they use **time tickets** to record the amount of time they have worked on a specific job. Exhibit 5 illustrates time tickets for Jobs 71 and 72 at **Legend Guitars**.



20 units of Jazz Series guitars

Balance

**Direct Materials** 

**Factory Overhead** 

Direct Labor

\$3,000

2,000

3,500

Exhibit 5 shows that on December 13, 2016, D. McInnis spent six hours working on Job 71 at an hourly rate of \$10 for a cost of \$60 (6 hrs. × \$10). Exhibit 5 also indicates that a total of 350 hours was spent by employees on Job 71 during December for a total cost of \$3,500. This total direct labor cost of \$3,500 is posted to the job cost sheet for Job 71, as shown in Exhibit 5.

Likewise, Exhibit 5 shows that on December 26, 2016, S. Andrews spent eight hours on Job 72 at an hourly rate of \$15 for a cost of \$120 (8 hrs. × \$15). A total of 500 hours was spent by employees on Job 72 during December for a total cost of \$7,500. This total direct labor cost of \$7,500 is posted to the job cost sheet for Job 72, as shown in Exhibit 5.

A summary of the time tickets is used as the basis for the journal entry recording direct labor for the month. This entry increases (debits) Work in Process and increases (credits) Wages Payable, as follows:

C.	Work in Process  Wages Payable  Factory labor used in production  of jobs (\$3,500 + \$7,500).	11,000	11,000	
----	------------------------------------------------------------------------------------------------	--------	--------	--

As with direct materials, many businesses use computerized information processing to record direct labor. In such cases, employees may log their time directly into computer terminals at their workstations. In other cases, employees may be issued magnetic cards, much like credit cards, to log in and out of work assignments.

# Example Exercise 17-2 Direct Labor Costs



During March, Hatch Company accumulated 800 hours of direct labor costs on Job 101 and 600 hours on Job 102. The total direct labor was incurred at a rate of \$16 per direct labor hour for Job 101 and \$12 per direct labor hour for Job 102. Journalize the entry to record the flow of labor costs into production during March.

# Follow My Example 17-2

Work in Process ..... 20.000*

20,000 Wages Payable.....

*Job 101  $$12,800 = 800 \text{ hrs.} \times $16$ Job 102  $7,200 = 600 \text{ hrs.} \times $12$ 

Total \$20,000

Practice Exercises: PE 17-2A, PE 17-2B



# 

#### **BMW'S FACTORY LABOR EXPERIMENT**

In 2007, managers at Bavarian Motorworks (BMW) began to worry about the increasing age of their workforce. The average age of manufacturing plant workers was expected to increase from 39 to 47 by 2017. To plan for this change, BMW conducted an experiment by altering the age makeup of workers on one of the

company's production lines to match the average age anticipated in 2017. In addition, the company made 70 changes to the production line to reduce the chance of error and physical strain. The changes resulted in a 7% improvement in productivity and a 2% decrease in employee absences from work. The company now uses the line as a model of quality and productivity for the rest of the company.

Source: C. Loch, F. Sting, N. Bauer, and H. Mauermann, "How BMW Is Defusing the Demographic Time Bomb," Harvard Business Review, March 2010.

# **Factory Overhead**

Factory overhead includes all manufacturing costs except direct materials and direct labor. Factory overhead costs come from a variety of sources, including the following:

- Indirect materials comes from a summary of materials requisitions.
- Indirect labor comes from the salaries of production supervisors and the wages of other employees such as janitors.
- Factory power comes from utility bills.
- Factory depreciation comes from Accounting Department computations of depreciation.

To illustrate the recording of factory overhead, assume that **Legend Guitars** incurred \$4,600 of overhead during December, which included \$500 of indirect materials, \$2,000 of indirect labor, \$900 of utilities, and \$1,200 of factory depreciation. The \$500 of indirect materials consisted of \$200 of glue and \$300 of sandpaper. The entry to record the factory overhead is as follows:

	d.	Factory Overhead	4,600		
		Materials		500	
		Wages Payable		2,000	
		Utilities Payable		900	
		Accumulated Depreciation		1,200	
		Factory overhead incurred in production.			

# **Example Exercise 17-3** Factory Overhead Costs



During March, Hatch Company incurred factory overhead costs as follows: indirect materials, \$800; indirect labor, \$3,400; utilities cost, \$1,600; and factory depreciation, \$2,500. Journalize the entry to record the factory overhead incurred during March.

Follow My Example 17-3		
Factory Overhead	8,300	
Materials		800
Wages Payable		3,400
Utilities Payable		1,600

Accumulated Depreciation—Factory .....

Practice Exercises: PE 17-3A, PE 17-3B

2,500

**Allocating Factory Overhead** Factory overhead is different from direct labor and direct materials in that it is *indirectly* related to the jobs. That is, factory overhead costs cannot be identified with or traced to specific jobs. For this reason, factory overhead costs are allocated to jobs. The process by which factory overhead or other costs are assigned to a cost object, such as a job, is called **cost allocation**.

The factory overhead costs are *allocated* to jobs using a common measure related to each job. This measure is called an **activity base**, *allocation base*, or *activity driver*. The activity base used to allocate overhead should reflect the consumption or use of factory overhead costs. Three common activity bases used to allocate factory overhead costs are direct labor hours, direct labor cost, and machine hours.

**Predetermined Factory Overhead Rate** Factory overhead costs are normally allocated or *applied* to jobs using a **predetermined factory overhead rate**. The predetermined factory overhead rate is computed as follows:

Predetermined Factory
Overhead Rate = Estimated Total Factory Overhead Costs
Estimated Activity Base

To illustrate, assume that **Legend Guitars** estimates the total factory overhead cost as \$50,000 for the year and the activity base as 10,000 direct labor hours. The predetermined factory overhead rate of \$5 per direct labor hour is computed as follows:

$$\frac{\text{Predetermined Factory}}{\text{Overhead Rate}} = \frac{\$50,000}{10,000 \text{ direct labor hours}} = \$5 \text{ per direct labor hour}$$

As illustrated, the predetermined overhead rate is computed using *estimated* amounts at the beginning of the period. This is because managers need timely information on the product costs of each job. If a company waited until all overhead costs were known at the end of the period, the allocated factory overhead would be accurate, but not timely. Only through timely reporting can managers adjust manufacturing methods or product pricing.

Many companies are using a method for accumulating and allocating factory overhead costs. This method, called **activity-based costing**, uses a different overhead rate for each type of factory overhead activity, such as inspecting, moving, and machining. Activity-based costing is discussed and illustrated in Chapter 26.

**Applying Factory Overhead to Work in Process Legend Guitars** applies factory overhead using a rate of \$5 per direct labor hour. The factory overhead applied to each job is recorded in the job cost sheets, as shown in Exhibit 6.

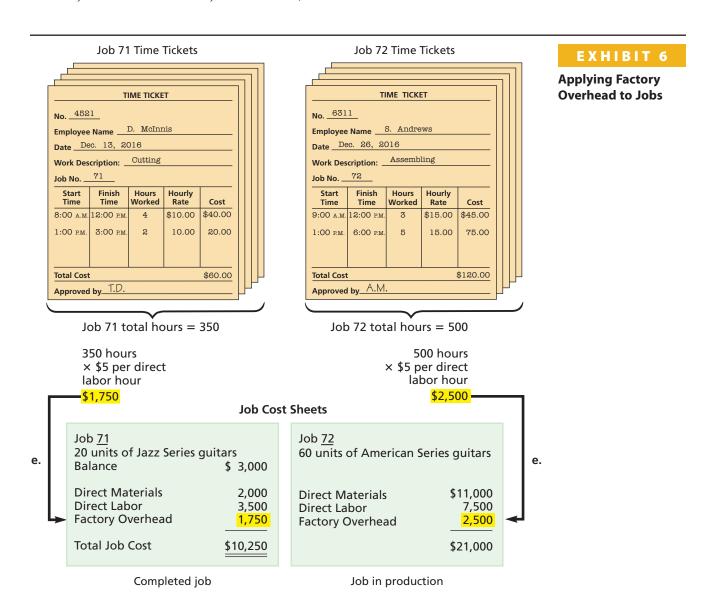


Exhibit 6 shows that 850 direct labor hours were used in Legend Guitars' December operations. Based on the time tickets, 350 hours can be traced to Job 71, and 500 hours can be traced to Job 72.

Using a factory overhead rate of \$5 per direct labor hour, \$4,250 of factory overhead is applied as follows:

	<b>Direct Labor Hours</b>	<b>Factory Overhead Rate</b>	Factory Overhead Applied
Job 71	350	\$5	\$1,750 (350 hrs. × \$5)
Job 72	500	\$5	_2,500 (500 hrs. × \$5)
Total	850		\$4,250

As shown in Exhibit 6, the applied overhead is posted to each job cost sheet. Factory overhead of \$1,750 is posted to Job 71, which results in a total product cost on December 31, 2016, of \$10,250. Factory overhead of \$2,500 is posted to Job 72, which results in a total product cost on December 31, 2016, of \$21,000.

The journal entry to apply factory overhead increases (debits) Work in Process and credits Factory Overhead. This journal entry to apply overhead to Jobs 71 and 72 is as follows:

e. Work in Process  Factory Overhead  Factory overhead applied to jobs  according to the predetermined  overhead rate (850 hrs. × \$5).	4,250	4,250	
-----------------------------------------------------------------------------------------------------------------------------------------	-------	-------	--

To summarize, the factory overhead account is:

- Increased (debited) for the actual overhead costs incurred, as shown for transaction (d).
- Decreased (credited) for the applied overhead, as shown for transaction (e).

The actual and applied overhead usually differ because the actual overhead costs are normally different from the estimated overhead costs. Depending on whether actual overhead is greater or less than applied overhead, the factory overhead account will either have a debit or credit ending balance as follows:

- If the applied overhead is *less than* the actual overhead incurred, the factory overhead
  account will have a debit balance. This debit balance is called underapplied factory
  overhead or *underabsorbed factory overhead*.
- If the applied overhead is more than the actual overhead incurred, the factory overhead
  account will have a credit balance. This credit balance is called overapplied factory
  overhead or overabsorbed factory overhead.

The factory overhead account for Legend Guitars, which follows, illustrates both underapplied and overapplied factory overhead. Specifically, the December 1, 2016, credit balance of \$200 represents overapplied factory overhead. In contrast, the December 31, 2016, debit balance of \$150 represents underapplied factory overhead.

count	Fac	tory Overhead			Account No.			
Date	•	ltem	Post. Ref.	Debit	Credit	Bala Debit	nce Credit	
²⁰¹⁶ Dec.	1 31 31	Balance Factory overhead cost incurred Factory overhead cost applied		4,600	4,250	4,400 150	200	
Underapplied balance Overapplied balance								

If the balance of factory overhead (either underapplied or overapplied) becomes large, the balance and related overhead rate should be investigated. For example, a large balance could be caused by changes in manufacturing methods. In this case, the factory overhead rate should be revised.

# Example Exercise 17-4 Applying Factory Overhead

**OBJ 2** 

Hatch Company estimates that total factory overhead costs will be \$100,000 for the year. Direct labor hours are estimated to be 25,000. For Hatch Company, (a) determine the predetermined factory overhead rate using direct labor hours as the activity base, (b) determine the amount of factory overhead applied to Jobs 101 and 102 in March, using the data on direct labor hours from Example Exercise 17-2, and (c) prepare the journal entry to apply factory overhead to both jobs in March according to the predetermined overhead rate.

Fc	Ilow My I	Example 17-4	
	mow my		
a.	\$4.00 per di	direct labor hour = \$100,000 ÷ 25,000 direct labor hours	
b.	Job 101	$$3,200 = 800 \text{ hours} \times $4.00 \text{ per hour}$	
	Job 102	$2,400 = 600 \text{ hours} \times $4.00 \text{ per hour}$	
	Total	\$5,600	
c.	Work in Pro	ocess 5.600	

Practice Exercises: PE 17-4A, PE 17-4B

5,600

**Disposal of Factory Overhead Balance** During the year, the balance in the factory overhead account is carried forward and reported as a deferred debit or credit on the monthly (interim) balance sheets. However, any balance in the factory overhead account should not be carried over to the next year. This is because any such balance applies only to operations of the current year.

If the estimates for computing the predetermined overhead rate are reasonably accurate, the ending balance of Factory Overhead should be relatively small. For this reason, the balance of Factory Overhead at the end of the year is disposed of by transferring it to the cost of goods sold account as follows:²

• If there is an ending debit balance (underapplied overhead) in the factory overhead account, it is disposed of by the entry that follows:

Cost of Goods Sold Factory Overhead Transfer of underapplied overhead to cost of goods sold.	XXX	XXX	
----------------------------------------------------------------------------------------------	-----	-----	--

• If there is an ending credit balance (overapplied overhead) in the factory overhead account, it is disposed of by the entry that follows:

Factory Overhead  Cost of Goods Sold  Transfer of overapplied  overhead to cost of goods sold.	XXX	XXX	
------------------------------------------------------------------------------------------------	-----	-----	--

² An ending balance in the factory overhead account may also be allocated among the work in process, finished goods, and cost of goods sold accounts. This brings these accounts into agreement with the actual costs incurred. This approach is rarely used and is only required for large ending balances in the factory overhead account. For this reason, it will not be used in this text.

To illustrate, the journal entry to dispose of **Legend Guitars**' December 31, 2016, underapplied overhead balance of \$150 is as follows:

f. Cost of Goods Sold Factory Overhead Closed underapplied factory overhead to cost of goods		150
----------------------------------------------------------------------------------------------	--	-----

### **Work in Process**

During the period, Work in Process is increased (debited) for the following:

- Direct materials cost
- Direct labor cost
- · Applied factory overhead cost

To illustrate, the work in process account for **Legend Guitars** is shown in Exhibit 7. The balance of Work in Process on December 1, 2016 (beginning balance), was \$3,000. As shown in Exhibit 7, this balance relates to Job 71, which was the only job in process on this date. During December, Work in Process was debited for the following:

- Direct materials cost of \$13,000 [transaction (b)], based on materials requisitions.
- Direct labor cost of \$11,000 [transaction (c)], based on time tickets.
- Applied factory overhead of \$4,250 [transaction (e)], based on the predetermined overhead rate of \$5 per direct labor hour.

The preceding Work in Process debits are supported by the detail postings to job cost sheets for Jobs 71 and 72, as shown in Exhibit 7.

# EXHIBIT 7

Job Cost Sheets and the Work in Process Controlling Account

#### **Job Cost Sheets**

Dii Fa	rect Ma rect Lak ctory O tal Job	oor verh	ead	2,000 3,500 1,750 \$10,250	D F	Direct Materials \$11,000 Direct Labor 7,500 Factory Overhead 2,500  Total Job Cost \$21,000			
	nit Cost			\$512.50					
Δα	count	<b>Ι</b> Ι//ο	rk in Process					Account	No
Ac	ccount	t Wo	rk in Process					Account Bala	No.
Ac	ccount Date		rk in Process Item		Post. Ref.	Debit	Credit		

During December, Job 71 was completed. Upon completion, the product costs (direct materials, direct labor, factory overhead) are totaled. This total is divided by the number of units produced to determine the cost per unit. Thus, the 20 Jazz Series guitars produced as Job 71 cost  $$512.50 ($10,250 \div 20)$ per guitar.$ 

After completion, Job 71 is transferred from Work in Process to Finished Goods by the following entry:

g. Finished Goods Work in Process Job 71 compl	10,250 eted in December.	10,250	
------------------------------------------------------	--------------------------	--------	--

Job 72 was started in December but was not completed by December 31, 2016. Thus, Job 72 is still part of work in process on December 31, 2016. As shown in Exhibit 7, the balance of the job cost sheet for Job 72 (\$21,000) is also the December 31, 2016, balance of Work in Process.

# **Example Exercise 17-5 Job Costs**

for 1,000

At the end of March, Hatch Company had completed Jobs 101 and 102. Job 101 is for 500 units, and Job 102 is for 1,000 units. Using the data from Example Exercises 17-1, 17-2, and 17-4, determine (a) the balance on the job cost sheets for Jobs 101 and 102 at the end of March and (b) the cost per unit for Jobs 101 and 102 at the end of March.

#### Follow My Example 17-5 Job 101 **Job 102** Direct materials \$ 2,400 \$ 4,200 Direct labor 12,800 7,200 2,400 Factory overhead 3,200 Total costs \$18,400 \$13,800 Job 101 $$36.80 = $18,400 \div 500 \text{ units}$ Job 102 $$13.80 = $13,800 \div 1,000 \text{ units}$

Practice Exercises: PE 17-5A, PE 17-5B

## **Finished Goods**

The finished goods account is a controlling account for the subsidiary **finished goods ledger** or *stock ledger*. Each account in the finished goods ledger contains cost data for the units manufactured, units sold, and units on hand.

Exhibit 8 illustrates the finished goods ledger account for **Legend Guitars**' Jazz Series guitars.

Manufactured			ed Shipped		Balance				
Job Order No.	Quantity	Amount	Ship Order No.	Quantity	Amount	Date	Quantity	Amount	Unit Cost
						Dec. 1	40	\$20,000	\$500.00
			643	40	\$20,000	9	_	_	_
71	20	\$10,250				31	20	10,250	512.50

**EXHIBIT 8** 

Finished Goods Ledger Account

Exhibit 8 indicates that there were 40 Jazz Series guitars on hand on December 1, 2016. During the month, 20 additional Jazz guitars were completed and transferred to Finished Goods from the completion of Job 71. In addition, the beginning inventory of 40 Jazz guitars was sold during the month.

# Sales and Cost of Goods Sold

During December, **Legend Guitars** sold 40 Jazz Series guitars for \$850 each, generating total sales of \$34,000 (\$850  $\times$  40 guitars). Exhibit 8 indicates that the cost of these guitars was \$500 per guitar or a total cost of \$20,000 (\$500  $\times$  40 guitars). The entries to record the sale and related cost of goods sold are as follows:



In a job order cost accounting system, the preparation of a statement of cost of goods manufactured, which was discussed in Chapter 16, is not necessary. This is because job order costing uses the perpetual inventory system and, thus, the cost of goods sold can be directly determined from the finished goods ledger as illustrated in Exhibit 8.

# Example Exercise 17-6 Cost of Goods Sold



Nejedly Company completed 80,000 units during the year at a cost of \$680,000. The beginning finished goods inventory was 10,000 units at \$80,000. Determine the cost of goods sold for 60,000 units, assuming a FIFO cost flow.

Cost of 40 Jazz Series guitars sold.

# Follow My Example 17-6

 $$505,000 = $80,000 + (50,000 \times $8.50*)$ 

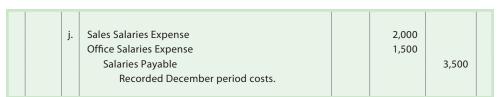
*Cost per unit of goods produced during the year =  $\$8.50 = \$680,000 \div 80,000$  units

Practice Exercises: PE 17-6A, PE 17-6B

### **Period Costs**

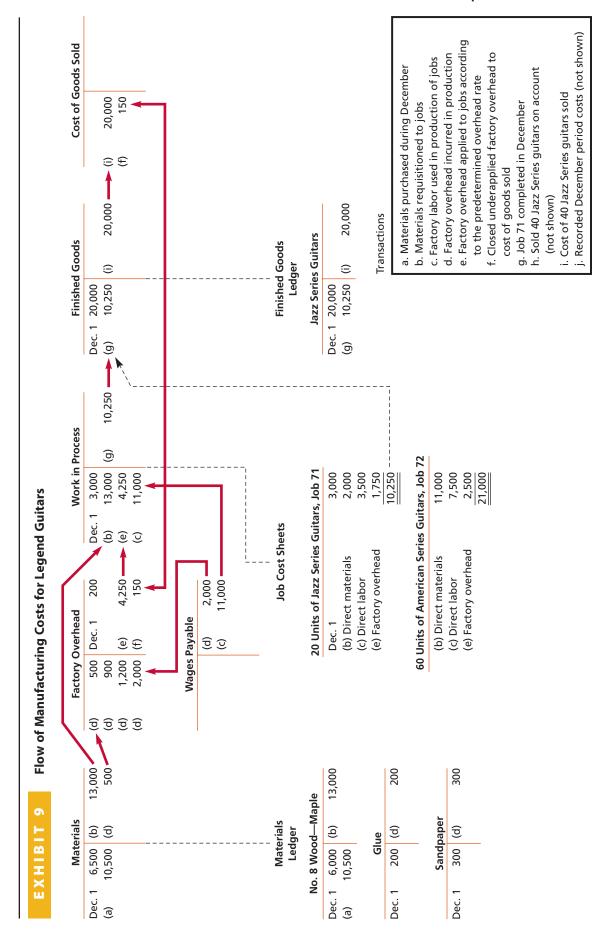
Period costs are used in generating revenue during the current period but are not involved in the manufacturing process. As discussed in Chapter 16, *period costs* are recorded as expenses of the current period as either selling or administrative expenses.

Selling expenses are incurred in marketing the product and delivering sold products to customers. Administrative expenses are incurred in managing the company but are not related to the manufacturing or selling functions. During December, **Legend Guitars** recorded the following selling and administrative expenses:



# **Summary of Cost Flows for Legend Guitars**

Exhibit 9 shows the cost flows through the manufacturing accounts of **Legend Guitars** for December.



In addition, summary details of the following subsidiary ledgers are shown:

- Materials Ledger—the subsidiary ledger for Materials.
- Job Cost Sheets—the subsidiary ledger for Work in Process.
- Finished Goods Ledger—the subsidiary ledger for Finished Goods.

Entries in the accounts shown in Exhibit 9 are identified by letters. These letters refer to the journal entries described and illustrated in the chapter. Entries (h) and (j) are not shown because they do not involve a flow of manufacturing costs.

As shown in Exhibit 9, the balances of Materials, Work in Process, and Finished Goods are supported by their subsidiary ledgers. These balances are as follows:

	Balance and Total of Related
Controlling Account	Subsidiary Ledger
Materials	\$ 3,500
Work in Process	21,000
Finished Goods	10,250

The income statement for Legend Guitars is shown in Exhibit 10.

## **EXHIBIT 10**

### Income Statement of Legend Guitars

Legend Guitars Income Statement For the Month Ended December 31, 2016		
Sales  Cost of goods sold.  Gross profit  Selling and administrative expenses:		\$34,000 <u>20,150</u> * \$13,850
Sales salaries expense	\$2,000 _1,500	
Total selling and administrative expenses. Income from operations		3,500 \$10,350



# **Job Order Costing for Decision Making**

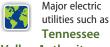
A job order cost accounting system accumulates and records product costs by jobs. The resulting total and unit product costs can be compared to similar jobs, compared over time, or compared to expected costs. In this way, a job order cost system can be used by managers for cost evaluation and control.

To illustrate, Exhibit 11 shows the direct materials used for Jobs 54 and 63 for **Legend Guitars**. The wood used in manufacturing guitars is measured in board feet. Because Jobs 54 and 63 produced the same type and number of guitars, the direct materials cost per unit should be about the same. However, the materials cost per guitar for Job 54 is \$100, while for Job 63 it is \$125. Thus, the materials costs are significantly more for Job 63.

The job cost sheets shown in Exhibit 11 can be analyzed for possible reasons for the increased materials cost for Job 63. Because the materials price did not change (\$10 per board foot), the increased materials cost must be related to wood consumption.

Comparing wood consumed for Jobs 54 and 63 shows that 400 board feet were used in Job 54 to produce 40 guitars. In contrast, Job 63 used 500 board feet to produce the same number of guitars. Thus, an investigation should be undertaken to determine the cause of the extra 100 board feet used for Job 63. Possible explanations could include the following:

 A new employee, who was not properly trained, cut the wood for Job 63. As a result, there was excess waste and scrap.



Valley Authority,
Consolidated Edison
Inc., and Pacific Gas
and Electric Company
use job order accounting to
control the costs associated
with major repairs and
overhauls that occur during
maintenance shutdowns.

	Materials Quantity (board feet)	Materials Price	Materials Amount
Direct materials:			
No. 8 Wood—Maple	400	\$10.00	\$4,000
Direct materials per guita	r		<u>\$ 100</u> *
*\$4,000 ÷ 40			<del></del>
Job 63			
Item: 40 Jazz Series guitar	'S		
	Materials Quantity	Materials	
	(beaud foot)	Price	Materials Amount
	(board feet)	11166	
Direct materials:	(board feet)	THE	
Direct materials: No. 8 Wood—Maple	500	\$10.00	\$5,000

#### EXHIBIT 11

Comparing Data from Job Cost Sheets

- The wood used for Job 63 was purchased from a new supplier. The wood was of poor quality, which created excessive waste and scrap.
- The cutting tools needed repair and were not properly maintained. As a result, the wood was miscut, which created excessive waste and scrap.
- The instructions attached to the job were incorrect. The wood was cut according to the
  instructions. The incorrect instructions were discovered later in assembly. As a result,
  the wood had to be recut and the initial cuttings scrapped.

# **Job Order Cost Systems for Professional Service Businesses**

A job order cost accounting system may be used for a professional service business. For example, an advertising agency, an attorney, and a physician each provide services to individual customers, clients, or patients. In such cases, the customer, client, or patient can be viewed as a job for which costs are accumulated and reported.

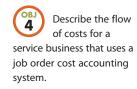
The primary product costs for a service business are direct labor and overhead costs. Any materials or supplies used in rendering services are normally insignificant. As a result, materials and supply costs are included as part of the overhead cost.

Like a manufacturing business, direct labor and overhead costs of rendering services to clients are accumulated in a work in process account. Work in Process is supported by a cost ledger with a job cost sheet for each client.

When a job is completed and the client is billed, the costs are transferred to a cost of services account. Cost of Services is similar to the cost of merchandise sold account for a merchandising business or the cost of goods sold account for a manufacturing business. A finished goods account and related finished goods ledger are not necessary. This is because the revenues for the services are recorded only after the services are provided.

In practice, other considerations unique to service businesses may need to be considered. For example, a service business may bill clients on a weekly or monthly basis rather than when a job is completed. In such cases, a portion of the costs related to each billing is transferred from the work in process account to the cost of services account. A service business may also bill clients for services in advance, which would be accounted for as deferred revenue until the services are completed.

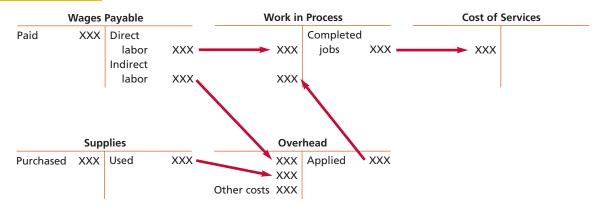
The flow of costs through a service business using a job order cost accounting system is shown in Exhibit 12.





#### **EXHIBIT 12**

#### Flow of Costs Through a Service Business



# **Service**



# Focus

#### **JOB ORDER COSTING IN A LAW FIRM**

Law firms typically use job order costing to track the costs of individual legal cases or client engagements. The costs of each job are accumulated in a job cost sheet, just as in a manufacturing firm. However, because a law firm is a service firm, there are no direct materials costs. The primary cost comes from the direct labor of the professional staff.

Law firms like, Constangy, Brooks, and Smith, a national law firm specializing in employment law and labor relations, uses a job order costing system to track the cost of individual cases. The direct labor costs of the professional

staff are determined by multiplying the time that each attorney spends on an individual case by the attorney's hourly billing rate. Billing rates vary depending on the rank of the attorney doing the work. In addition, any costs that can be directly attributed to a specific engagement are added to the engagement's job cost sheet. For example, if a case requires the legal team to travel to another city to interview witnesses, the cost of that travel is added to the job cost sheet for that specific client. Indirect costs, such as support staff, office supplies, and office rent, are accumulated as overhead costs and allocated to individual jobs using an activity base, such as professional service hours.

# At a Glance 17



### Describe cost accounting systems used by manufacturing businesses.

**Key Points** A cost accounting system accumulates product costs. The two primary cost accounting systems are the job order and the process cost systems. Job order cost systems accumulate costs for each quantity of product that passes through the factory. Process cost systems accumulate costs for each department or process within the factory.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe a cost accounting system.		
Describe a job order cost system.		
Describe a process cost system.		



#### Describe and illustrate a job order cost accounting system.

**Key Points** A job order cost system accumulates costs for each quantity of product, or "job," that passes through the factory. Direct materials, direct labor, and factory overhead are accumulated on the job cost sheet, which is the subsidiary cost ledger for each job. Direct materials and direct labor are assigned to individual jobs, based on the quantity used. Factory overhead costs are assigned to each job, based on an activity base that reflects the use of factory overhead costs.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the flow of materials and how materials costs are assigned.</li> </ul>		
• Prepare the journal entry to record materials used in production.	EE17-1	PE17-1A, 17-1B
<ul> <li>Describe how factory labor hours are recorded and how labor costs are assigned.</li> </ul>		
<ul> <li>Prepare the journal entry to record factory labor used in production.</li> </ul>	EE17-2	PE17-2A, 17-2B
<ul> <li>Describe and illustrate how factory overhead costs are accumulated and assigned.</li> </ul>	EE17-3 EE17-4	PE17-3A, 17-3B PE17-4A, 17-4B
• Compute the predetermined overhead rate.	EE17-4	PE17-4A, 17-4B
• Describe and illustrate how to dispose of the balance in the factory overhead account.		
<ul> <li>Describe and illustrate how costs are accumulated for work in process and finished goods inventories.</li> </ul>	EE17-5	PE17-5A, 17-5B
• Describe how costs are assigned to the cost of goods sold.	EE17-6	PE17-6A, 17-6B
• Describe and illustrate the flow of costs.		



#### Describe the use of job order cost information for decision making.

**Key Points** Job order cost systems can be used to evaluate cost performance. Unit costs can be compared over time to determine if product costs are staying within expected ranges.

Learning Outcome	Example Exercises	Practice Exercises
• Describe and illustrate how job cost sheets can be used to investigate possible reasons for increased product costs.		



#### Describe the flow of costs for a service business that uses a job order cost accounting system.

**Key Points** Job order cost accounting systems can be used by service businesses to plan and control operations. Because the product is a service, the focus is on direct labor and overhead costs. The costs of providing a service are accumulated in a work in process account and transferred to a cost of services account upon completion.

Learning Outcome	Example Exercises	Practice Exercises
• Describe how service businesses use a job order cost system.		

# **Key Terms**

activity base (798) activity-based costing (799) cost accounting systems (792) cost allocation (798) finished goods ledger (803) job cost sheets (795) job order cost system (792) materials ledger (794) materials requisition (795) overapplied factory overhead (800) predetermined factory overhead rate (798)

process cost system (792) receiving report (795) time tickets (796) underapplied factory overhead (800)

# **Illustrative Problem**

Wildwing Entertainment Inc. is a manufacturer that uses a job order cost system. The following data summarize the operations related to production for March, the first month of operations:

- a. Materials purchased on account, \$15,500.
- b. Materials requisitioned and labor used:

		Factory
	Materials	Labor
Job No. 100	\$2,650	\$1,770
Job No. 101	1,240	650
Job No. 102	980	420
Job No. 103	3,420	1,900
Job No. 104	1,000	500
Job No. 105	2,100	1,760
For general factory use	450	650

- c. Factory overhead costs incurred on account, \$2,700.
- d. Depreciation of machinery, \$1,750.
- e. Factory overhead is applied at a rate of 70% of direct labor cost.
- f. Jobs completed: Nos. 100, 101, 102, 104.
- g. Jobs 100, 101, and 102 were shipped, and customers were billed for \$8,100, \$3,800, and \$3,500, respectively.

#### **Instructions**

- 1. Journalize the entries to record these transactions.
- 2. Determine the account balances for Work in Process and Finished Goods.
- 3. Prepare a schedule of unfinished jobs to support the balance in the work in process account.
- 4. Prepare a schedule of completed jobs on hand to support the balance in the finished goods account.

#### Solution

1.	a.	Materials	15,500	
		Accounts Payable		15,500
	b.	Work in Process	11,390	
		Materials		11,390
		Work in Process	7,000	
		Wages Payable		7,000
		Factory Overhead	1,100	
		Materials		450
		Wages Payable		650
	c.	Factory Overhead	2,700	
		Accounts Payable		2,700
	d.	Factory Overhead	1,750	
		Accumulated Depreciation—Machinery		1,750
	e.	Work in Process	4,900	
		Factory Overhead (70% of \$7,000)		4,900
	f.	Finished Goods	11,548	
		Work in Process		11,548

Computation of the cost of jobs finished:

Job	Direct Materials	Direct Labor	Factory Overhead	Total	
Job No. 100	\$2,650	\$1,770	\$1,239	\$ 5,659	
Job No. 101	1,240	650	455	2,345	
Job No. 102	980	420	294	1,694	
Job No. 104	1,000	500	350	1,850	
				\$11,548	
g. Accounts Receivable 15,400					
Sales				15,400	
Cost of Goo	98				
Finished	d Goods			9,698	

### Cost of jobs sold computation:

Job No. 100	\$5,659
Job No. 101	2,345
Job No. 102	1,694
	\$9,698

2. Work in Process: \$11,742 (\$11,390 + \$7,000 + \$4,900 - \$11,548)

Finished Goods: \$1,850 (\$11,548 - \$9,698)

# 3. Schedule of Unfinished Jobs

	Direct		Factory	
Job	Materials	Direct Labor	Overhead	Total
Job No. 103	\$3,420	\$1,900	\$1,330	\$ 6,650
Job No. 105	2,100	1,760	1,232	5,092
Balance of Wo	\$11,742			

### 4. Schedule of Completed Jobs

Job No. 104:	
Direct materials	\$1,000
Direct labor	500
Factory overhead	350
Balance of Finished Goods, March 31	\$1,850

# **Discussion Questions**

- a. Name two principal types of cost accounting systems.
  - b. Which system provides for a separate record of each particular quantity of product that passes through the factory?
  - c. Which system accumulates the costs for each department or process within the factory?
- 2. What kind of firm would use a job order cost system?
- 3. Which account is used in the job order cost system to accumulate direct materials, direct labor, and factory overhead applied to production costs for individual jobs?
- 4. What document is the source for (a) debiting the accounts in the materials ledger and (b) crediting the accounts in the materials ledger?
- 5. What is a job cost sheet?
- 6. What is the difference between a clock card and time ticket?

- 7. Discuss how the predetermined factory overhead rate can be used in job order cost accounting to assist management in pricing jobs.
- 8. a. How is a predetermined factory overhead rate calculated?
  - b. Name three common bases used in calculating the rate.
- 9. a. What is (1) overapplied factory overhead and (2) underapplied factory overhead?
  - b. If the factory overhead account has a debit balance, was factory overhead underapplied or overapplied?
  - c. If the factory overhead account has a credit balance at the end of the first month of the fiscal year, where will the amount of this balance be reported on the interim balance sheet?



Describe how a job order cost system can be used for professional service businesses.

# **Practice Exercises**

**EE 17-1** p. 796

#### PE 17-1A Issuance of materials

OBJ. 2



On April 6, Almerinda Company purchased on account 60,000 units of raw materials at \$12 per unit. On April 21, raw materials were requisitioned for production as follows: 25,000 units for Job 50 at \$10 per unit and 27,000 units for Job 51 at \$12 per unit. Journalize the entry on April 6 to record the purchase and on April 21 to record the requisition from the materials storeroom.

**EE 17-1** p. 796

#### **PE 17-1B** Issuance of materials

OBJ. 2



On August 4, Rothchild Company purchased on account 12,000 units of raw materials at \$14 per unit. On August 24, raw materials were requisitioned for production as follows: 5,000 units for Job 40 at \$8 per unit and 6,200 units for Job 42 at \$14 per unit. Journalize the entry on August 4 to record the purchase and on August 24 to record the requisition from the materials storeroom.

#### **EE 17-2** *p. 797*

#### PE 17-2A Direct labor costs

OBJ. 2



During April, Almerinda Company accumulated 20,000 hours of direct labor costs on Job 50 and 24,000 hours on Job 51. The total direct labor was incurred at a rate of \$20.00 per direct labor hour for Job 50 and \$22.00 per direct labor hour for Job 51. Journalize the entry to record the flow of labor costs into production during April.

#### **EE 17-2** p. 797

#### PE 17-2B Direct labor costs

OBJ. 2



During August, Rothchild Company accumulated 3,500 hours of direct labor costs on Job 40 and 4,200 hours on Job 42. The total direct labor was incurred at a rate of \$25.00 per direct labor hour for Job 40 and \$23.50 per direct labor hour for Job 42. Journalize the entry to record the flow of labor costs into production during August.

#### **EE 17-3** *p. 798*

#### PE 17-3A Factory overhead costs

OBJ. 2



During April, Almerinda Company incurred factory overhead costs as follows: indirect materials, \$42,000; indirect labor, \$90,000; utilities cost, \$16,000; and factory depreciation, \$54,000. Journalize the entry to record the factory overhead incurred during April.

#### **EE 17-3** *p. 798*

#### PE 17-3B Factory overhead costs

OBJ. 2



During August, Rothchild Company incurred factory overhead costs as follows: indirect materials, \$17,500; indirect labor, \$22,000; utilities cost, \$9,600; and factory depreciation, \$17,500. Journalize the entry to record the factory overhead incurred during August.

#### **EE 17-4** p. 801

#### PE 17-4A Applying factory overhead

OBJ. 2



Almerinda Company estimates that total factory overhead costs will be \$1,750,000 for the year. Direct labor hours are estimated to be 500,000. For Almerinda Company, (a) determine the predetermined factory overhead rate using direct labor hours as the activity base, (b) determine the amount of factory overhead applied to Jobs 50 and 51 in April using the data on direct labor hours from Practice Exercise 17-2A, and (c) prepare the journal entry to apply factory overhead to both jobs in April according to the predetermined overhead rate.

#### **EE 17-4** p. 801

#### PE 17-4B Applying factory overhead

OBJ. 2



Rothchild Company estimates that total factory overhead costs will be \$810,000 for the year. Direct labor hours are estimated to be 90,000. For Rothchild Company, (a) determine the predetermined factory overhead rate using direct labor hours as the activity base, (b) determine the amount of factory overhead applied to Jobs 40 and 42 in August using the data on direct labor hours from Practice Exercise 17-2B, and (c) prepare the journal entry to apply factory overhead to both jobs in August according to the predetermined overhead rate.

#### **EE 17-5** *p. 803*

#### PE 17-5A Job costs

OBJ. 2



At the end of April, Almerinda Company had completed Jobs 50 and 51. Job 50 is for 23,040 units, and Job 51 is for 26,000 units. Using the data from Practice Exercises 17-1A, 17-2A, and 17-4A, determine (a) the balance on the job cost sheets for Jobs 50 and 51 at the end of April and (b) the cost per unit for Jobs 50 and 51 at the end of April.

#### **EE 17-5** p. 803

#### PE 17-5B Job costs

OBJ. 2



At the end of August, Rothchild Company had completed Jobs 40 and 42. Job 40 is for 10,000 units, and Job 42 is for 11,000 units. Using the data from Practice Exercises 17-1B, 17-2B, and 17-4B, determine (a) the balance on the job cost sheets for Jobs 40 and 42 at the end of August and (b) the cost per unit for Jobs 40 and 42 at the end of August.

#### **EE 17-6** p. 804

#### PE 17-6A Cost of goods sold

OBJ. 2



Hosmer Company completed 312,000 units during the year at a cost of \$7,800,000. The beginning finished goods inventory was 22,000 units at \$440,000. Determine the cost of goods sold for 325,000 units, assuming a FIFO cost flow.

#### **EE 17-6** p. 804

#### PE 17-6B Cost of goods sold

OBJ. 2



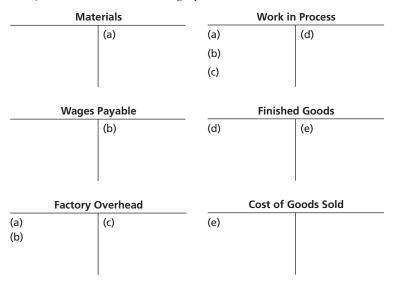
Skeleton Company completed 200,000 units during the year at a cost of \$3,000,000. The beginning finished goods inventory was 25,000 units at \$310,000. Determine the cost of goods sold for 210,000 units, assuming a FIFO cost flow.

## Exercises

#### EX 17-1 Transactions in a job order cost system

OBJ. 2

Five selected transactions for the current month are indicated by letters in the following T accounts in a job order cost accounting system:



Describe each of the five transactions.

#### EX 17-2 Cost flow relationships

OBJ. 2

**✓** b. \$1,005,200



The following information is available for the first month of operations of Kellman Inc., a manufacturer of art and craft items:

Sales	\$3,600,000
Gross profit	650,000
Indirect labor	216,000
Indirect materials	120,000
Other factory overhead	45,000
Materials purchased	1,224,000
Total manufacturing costs for the period	2,640,000
Materials inventory, end of period	98,800

Using this information, determine the following missing amounts:

- a. Cost of goods sold
- b. Direct materials cost
- c. Direct labor cost

May 27

#### EX 17-3 Cost of materials issuances under the FIFO method

OBJ. 2

#### √ b. \$2,280



RECEIVED			ISSUED		BALANCE				
Receiving Report Number	Quantity	Unit Price	Materials Requisition Number	Quantity	Amount	Date	Quantity	Unit Price	Amount
40	130	\$32.00				May 1 May 4	285	\$30.00	\$8,550
11	110	38 00	91	365		May 10			

An incomplete subsidiary ledger of materials inventory for May is as follows:

- a. Complete the materials issuances and balances for the materials subsidiary ledger under FIFO.
- b. Determine the materials inventory balance at the end of May.
- c. Journalize the summary entry to transfer materials to work in process.
- d. Explain how the materials ledger might be used as an aid in maintaining inventory quantities on hand.

#### EX 17-4 Entry for issuing materials

OBJ. 2





Journalize the entry to record the issuance of materials.

#### **EX 17-5** Entries for materials

OBJ. 2

Eclectic Ergonomics Company manufactures designer furniture. Eclectic Ergonomics uses a job order cost system. Balances on April 1 from the materials ledger are as follows:

Fabric	\$ 67,500
Polyester filling	20,200
Lumber	150,000
Glue	6.550

The materials purchased during April are summarized from the receiving reports as follows:

Fabric	\$338,400
Polyester filling	470,400
Lumber	902,400
Glue	32,400

Materials were requisitioned to individual jobs as follows:

		Polyester			
	Fabric	Filling	Lumber	Glue	Total
Job 81	\$127,400	\$160,800	\$401,200		\$ 689,400
Job 82	97,200	145,200	375,000		617,400
Job 83	91,200	118,400	210,000		419,600
Factory overhead—indirect materials				\$34,800	34,800
Total	\$315,800	\$424,400	\$986,200	\$34,800	\$1,761,200

(Continued)

✓ c. fabric, \$90,100



The glue is not a significant cost, so it is treated as indirect materials (factory overhead).

- a. Journalize the entry to record the purchase of materials in April.
- b. Journalize the entry to record the requisition of materials in April.
- c. Determine the April 30 balances that would be shown in the materials ledger accounts.

# EX 17-6 Entry for factory labor costs

OBJ. 2



A summary of the time tickets for the current month follows:

Job No.	Amount	Job No.	Amount	
100	\$ 3,860	Indirect	\$ 6,340	
101	4,300	111	7,120	
104	24,500	115	7,400	
108	18 600	117	32 000	

Journalize the entry to record the factory labor costs.

#### **EX 17-7** Entry for factory labor costs

OBJ. 2

The weekly time tickets indicate the following distribution of labor hours for three direct labor employees:

	Hours			
	Job 301	Job 302	Job 303	Process Improvement
Tom Couro	10	15	13	2
David Clancy	12	12	14	2
Jose Cano	11	13	15	1

The direct labor rate earned per hour by the three employees is as follows:

Tom Couro	\$32
David Clancy	36
Jose Cano	28

The process improvement category includes training, quality improvement, and other indirect tasks.

- a. Journalize the entry to record the factory labor costs for the week.
- b. Assume that Jobs 301 and 302 were completed but not sold during the week and that Job 303 remained incomplete at the end of the week. How would the direct labor costs for all three jobs be reflected on the financial statements at the end of the week?

#### EX 17-8 Entries for direct labor and factory overhead

OBJ. 2

Dash Industries Inc. manufactures recreational vehicles. Dash uses a job order cost system. The time tickets from April jobs are summarized as follows:

Job 201	\$5,250
Job 202	6,100
Job 203	4,280
Job 204	5,620
Factory supervision	2,785

Factory overhead is applied to jobs on the basis of a predetermined overhead rate of \$25 per direct labor hour. The direct labor rate is \$50 per hour.

- a. Journalize the entry to record the factory labor costs.
- b. Journalize the entry to apply factory overhead to production for April.



#### EX 17-9 Factory overhead rates, entries, and account balance

OBJ. 2

✓ b. \$36 per direct labor hour



Tiny Biggs Company operates two factories. The company applies factory overhead to jobs on the basis of machine hours in Factory 1 and on the basis of direct labor hours in Factory 2. Estimated factory overhead costs, direct labor hours, and machine hours are as follows:

	Factory 1	Factory 2
Estimated factory overhead cost for fiscal		
year beginning September 1	\$1,456,000	\$954,000
Estimated direct labor hours for year		26,500
Estimated machine hours for year	52,000	
Actual factory overhead costs for September	\$117,600	\$102,350
Actual direct labor hours for September		2,795
Actual machine hours for September	4,250	

- a. Determine the factory overhead rate for Factory 1.
- b. Determine the factory overhead rate for Factory 2.
- Journalize the entries to apply factory overhead to production in each factory for September.
- d. Determine the balances of the factory overhead accounts for each factory as of September 30, and indicate whether the amounts represent overapplied or underapplied factory overhead.

### **EX 17-10** Predetermined factory overhead rate

OBJ. 2

Spring Street Engine Shop uses a job order cost system to determine the cost of performing engine repair work. Estimated costs and expenses for the coming period are as follows:

Engine parts	\$	875,000
Shop direct labor		660,000
Shop and repair equipment depreciation		44,500
Shop supervisor salaries		138,000
Shop property taxes		27,500
Shop supplies		10,000
Advertising expense		22,100
Administrative office salaries		73,500
Administrative office depreciation expense		8,600
Total costs and expenses	\$1	,859,200

The average shop direct labor rate is \$30 per hour. Determine the predetermined shop overhead rate per direct labor hour.

#### EX 17-11 Predetermined factory overhead rate

OBJ. 2

Poehling Medical Center has a single operating room that is used by local physicians to perform surgical procedures. The cost of using the operating room is accumulated by each patient procedure and includes the direct materials costs (drugs and medical devices), physician surgical time, and operating room overhead. On January 1 of the current year, the annual operating room overhead is estimated to be:

Disposable supplies	\$299,600
Depreciation expense	75,000
Utilities	32,000
Nurse salaries	278,500
Technician wages	126,900
Total operating room overhead	\$812,000

(Continued)



✓ a. \$290 per hour



The overhead costs will be assigned to procedures, based on the number of surgical room hours. Poehling Medical Center expects to use the operating room an average of eight hours per day, seven days per week. In addition, the operating room will be shut down two weeks per year for general repairs.

- a. Determine the predetermined operating room overhead rate for the year.
- b. Bill Harris had a five-hour procedure on January 22. How much operating room overhead would be charged to his procedure, using the rate determined in part (a)?
- c. During January, the operating room was used 240 hours. The actual overhead costs incurred for January were \$67,250. Determine the overhead under- or overapplied for the period.

#### EX 17-12 Entry for jobs completed; cost of unfinished jobs

OBJ. 2

The following account appears in the ledger prior to recognizing the jobs completed in August:

	Work in Process
Balance, August 1	\$ 60,000
Direct materials	325,000
Direct labor	462,000
Factory overhead	210,000

Jobs finished during August are summarized as follows:

Job 210	\$197,800	Job 224	\$ 160,000
Job 216	240,000	Job 230	364,000

- a. Journalize the entry to record the jobs completed.
- b. Determine the cost of the unfinished jobs at August 31.

#### EX 17-13 Entries for factory costs and jobs completed

OBJ. 2

Old School Publishing Inc. began printing operations on January 1. Jobs 301 and 302 were completed during the month, and all costs applicable to them were recorded on the related cost sheets. Jobs 303 and 304 are still in process at the end of the month, and all applicable costs except factory overhead have been recorded on the related cost sheets. In addition to the materials and labor charged directly to the jobs, \$8,000 of indirect materials and \$12,400 of indirect labor were used during the month. The cost sheets for the four jobs entering production during the month are as follows, in summary form:

Job 301		Job 302	
Direct materials	\$10,000	Direct materials	\$20,000
Direct labor	8,000	Direct labor	17,000
Factory overhead	6,000	Factory overhead	12,750
Total	\$24,000	Total	\$49,750
Job 303		Job 304	
Direct materials	\$24,000	Direct materials	\$14,000
Direct labor	18,000	Direct labor	12,000
Factory overhead	_	Factory overhead	_

Journalize the summary entry to record each of the following operations for January (one entry for each operation):

- a. Direct and indirect materials used.
- b. Direct and indirect labor used.
- c. Factory overhead applied to all four jobs (a single overhead rate is used based on direct labor cost).
- d. Completion of Jobs 301 and 302.

**✓** b. \$95,200



✓ d. \$73,750

#### EX 17-14 Financial statements of a manufacturing firm

OBJ. 2

✓ a. Income from operations, \$170,000



The following events took place for Chi-Lite Inc. during June 2016, the first month of operations as a producer of road bikes:

- Purchased \$400,000 of materials.
- Used \$343,750 of direct materials in production.
- Incurred \$295,000 of direct labor wages.
- Applied factory overhead at a rate of 75% of direct labor cost.
- Transferred \$815,000 of work in process to finished goods.
- Sold goods with a cost of \$789,000.
- Sold goods for \$1,400,000.
- Incurred \$316,000 of selling expenses.
- Incurred \$125,000 of administrative expenses.
- a. Prepare the June income statement for Chi-Lite. Assume that Chi-Lite uses the perpetual inventory method.
- b. Determine the inventory balances at the end of the first month of operations.

#### EX 17-15 Decision making with job order costs

OBJ. 3

Alvarez Manufacturing Inc. is a job shop. The management of Alvarez Manufacturing Inc. uses the cost information from the job sheets to assess cost performance. Information on the total cost, product type, and quantity of items produced is as follows:

Date	Job No.	Product	Quantity	Amount
Jan. 2	1	TT	520	\$16,120
Jan. 15	22	SS	1,610	20,125
Feb. 3	30	SS	1,420	25,560
Mar. 7	41	TT	670	15,075
Mar. 24	49	SLK	2,210	22,100
May 19	58	SLK	2,550	31,875
June 12	65	TT	620	10,540
Aug. 18	78	SLK	3,110	48,205
Sept. 2	82	SS	1,210	16,940
Nov. 14	92	TT	750	8,250
Dec. 12	98	SLK	2,700	52,650

- a. Develop a graph for *each* product (three graphs), with Job Number (in date order) on the horizontal axis and Unit Cost on the vertical axis. Use this information to determine Alvarez Manufacturing Inc.'s cost performance over time for the three products.
- b. What additional information would you require in order to investigate Alvarez Manufacturing Inc.'s cost performance more precisely?

#### EX 17-16 Decision making with job order costs

**OBJ. 3** 

Raneri Trophies Inc. uses a job order cost system for determining the cost to manufacture award products (plaques and trophies). Among the company's products is an engraved plaque that is awarded to participants who complete a training program at a local business. The company sells the plaques to the local business for \$80 each.

Each plaque has a brass plate engraved with the name of the participant. Engraving requires approximately 30 minutes per name. Improperly engraved names must be redone. The plate is screwed to a walnut backboard. This assembly takes approximately 15 minutes per unit. Improper assembly must be redone using a new walnut backboard.

(Continued)

During the first half of the year, Raneri had two separate plaque orders. The job cost sheets for the two separate jobs indicated the following information:

Job 101	May 4		
	Cost per Unit	Units	Job Cost
Direct materials:			
Wood	\$20/unit	40 units	\$ 800
Brass	15/unit	40 units	600
Engraving labor	20/hr.	20 hrs.	400
Assembly labor	30/hr.	10 hrs.	300
Factory overhead	10/hr.	30 hrs.	300
			\$2,400
Plaques shipped			÷ 40
Cost per plaque			\$ 60

Job 105	June 10		
	Cost per Unit	Units	Job Cost
Direct materials:			
Wood	\$20/unit	34 units	\$ 680
Brass	15/unit	34 units	510
Engraving labor	20/hr.	17 hrs.	340
Assembly labor	30/hr.	8.5 hrs.	255
Factory overhead	10/hr.	25.5 hrs.	255 \$2,040
Plaques shipped Cost per plaque			÷ 30 \$ 68

- a. Why did the cost per plaque increase from \$60 to \$68?
- b. What improvements would you recommend for Raneri Trophies Inc.?

#### EX 17-17 Job order cost accounting for a service company

OBJ. 4

The law firm of Furlan and Benson accumulates costs associated with individual cases, using a job order cost system. The following transactions occurred during July:

- July 3. Charged 175 hours of professional (lawyer) time to the Obsidian Co. breech of contract suit to prepare for the trial, at a rate of \$150 per hour.
  - 10. Reimbursed travel costs to employees for depositions related to the Obsidian case, \$12,500.
  - 14. Charged 260 hours of professional time for the Obsidian trial at a rate of \$185 per hour.
  - 18. Received invoice from consultants Wadsley and Harden for \$30,000 for expert testimony related to the Obsidian trial.
  - 27. Applied office overhead at a rate of \$62 per professional hour charged to the Obsidian case.
  - 31. Paid administrative and support salaries of \$28,500 for the month.
  - 31. Used office supplies for the month, \$4,000.
  - 31. Paid professional salaries of \$74,350 for the month.
  - 31. Billed Obsidian \$172,500 for successful defense of the case.
- a. Provide the journal entries for each of these transactions.
- b. How much office overhead is over- or underapplied?
- c. Determine the gross profit on the Obsidian case, assuming that over- or underapplied office overhead is closed monthly to cost of services.

✓ b. Underapplied, \$5,530



#### ✓ d. Dr. Cost of Services, \$2,827,750



#### EX 17-18 Job order cost accounting for a service company

OBJ. 4

The Fly Company provides advertising services for clients across the nation. The Fly Company is presently working on four projects, each for a different client. The Fly Company accumulates costs for each account (client) on the basis of both direct costs and allocated indirect costs. The direct costs include the charged time of professional personnel and media purchases (air time and ad space). Overhead is allocated to each project as a percentage of media purchases. The predetermined overhead rate is 65% of media purchases.

On August 1, the four advertising projects had the following accumulated costs:

	August 1 Balances
Vault Bank	\$270,000
Take Off Airlines	80,000
Sleepy Tired Hotels	210,000
Tastee Beverages	115,000
Total	\$675,000

During August, The Fly Company incurred the following direct labor and media purchase costs related to preparing advertising for each of the four accounts:

	Direct Labor	Media Purchases
Vault Bank	\$ 190,000	\$ 710,000
Take Off Airlines	85,000	625,000
Sleepy Tired Hotels	372,000	455,000
Tastee Beverages	421,000	340,000
Total	\$1,068,000	\$2,130,000

At the end of August, both the Vault Bank and Take Off Airlines campaigns were completed. The costs of completed campaigns are debited to the cost of services account. Journalize the summary entry to record each of the following for the month:

- a. Direct labor costs
- b. Media purchases
- c. Overhead applied
- d. Completion of Vault Bank and Take Off Airlines campaigns

# **Problems: Series A**





#### PR 17-1A Entries for costs in a job order cost system

OBJ. 2

DiSalvio Co. uses a job order cost system. The following data summarize the operations related to production for May:

- a. Materials purchased on account, \$634,000.
- b. Materials requisitioned, \$646,200, of which \$74,500 was for general factory use.
- c. Factory labor used, \$660,200, of which \$91,200 was indirect.
- d. Other costs incurred on account for factory overhead, \$147,500; selling expenses, \$234,000; and administrative expenses, \$146,400.
- e. Prepaid expenses expired for factory overhead were \$29,200; for selling expenses, \$26,800; and for administrative expenses, \$18,000.
- f. Depreciation of office building was \$84,600; of office equipment, \$43,340; and of factory equipment, \$32,000.
- g. Factory overhead costs applied to jobs, \$362,000.
- h. Jobs completed, \$1,002,000.
- i. Cost of goods sold, \$890,000.

#### **Instructions**

Journalize the entries to record the summarized operations.

#### PR 17-2A Entries and schedules for unfinished jobs and completed jobs

OBJ. 2

✓ 3. Work in Process balance, \$27,288



General Ledger

Tybee Industries Inc. uses a job order cost system. The following data summarize the operations related to production for January 2016, the first month of operations:

- a. Materials purchased on account, \$29,800.
- b. Materials requisitioned and factory labor used:

Job	Materials	<b>Factory Labor</b>
301	\$ 2,960	\$2,775
302	3,620	3,750
303	2,400	1,875
304	8,100	6,860
305	5,100	5,250
306	3,750	3,340
For general factory use	1,080	4,100

- c. Factory overhead costs incurred on account, \$5,500.
- d. Depreciation of machinery and equipment, \$1,980.
- e. The factory overhead rate is \$54 per machine hour. Machine hours used:

Job	Machine Hours
301	25
302	36
303	30
304	72
305	40
306	25
Total	228

- f. Jobs completed: 301, 302, 303 and 305.
- g. Jobs were shipped and customers were billed as follows: Job 301, \$8,250; Job 302, \$11,200; Job 303, \$15,000.

#### **Instructions**

- 1. Journalize the entries to record the summarized operations.
- 2. Post the appropriate entries to T accounts for Work in Process and Finished Goods, using the identifying letters as transaction codes. Insert memo account balances as of the end of the month.
- 3. Prepare a schedule of unfinished jobs to support the balance in the work in process account.
- 4. Prepare a schedule of completed jobs on hand to support the balance in the finished goods account.

#### PR 17-3A Job order cost sheet

OBJ. 2, 3

Remnant Carpet Company sells and installs commercial carpeting for office buildings. Remnant Carpet Company uses a job order cost system. When a prospective customer asks for a price quote on a job, the estimated cost data are inserted on an unnumbered job cost sheet. If the offer is accepted, a number is assigned to the job, and the costs incurred are recorded in the usual manner on the job cost sheet. After the job is completed, reasons for the variances between the estimated and actual costs are noted on the sheet. The data are then available to management in evaluating the efficiency of operations and in preparing quotes on future jobs. On October 1, 2016, Remnant Carpet Company gave Jackson Consulting an estimate of \$9,450 to carpet the consulting firm's newly leased office. The estimate was based on the following data:



Estimated direct materials:	
200 meters at \$35 per meter	\$7,000
Estimated direct labor:	
16 hours at \$20 per hour	320
Estimated factory overhead (75% of direct labor cost)	240
Total estimated costs	\$7,560
Markup (25% of production costs)	1,890
Total estimate	\$9,450

On October 3, Jackson Consulting signed a purchase contract, and the delivery and installation was completed on October 10.

The related materials requisitions and time tickets are summarized as follows:

Materials Requisition No.	Description	Amount	
112	140 meters at \$35	\$4,900	
114	68 meters at \$35	2,380	
Time Ticket No.	Description	Amount	
Time Ticket No.	<b>Description</b> 10 hours at \$20	Amount \$200	

#### **Instructions**

- 1. Complete that portion of the job order cost sheet that would be prepared when the estimate is given to the customer.
- 2. Record the costs incurred, and prepare a job order cost sheet. Comment on the reasons for the variances between actual costs and estimated costs. For this purpose, assume that the additional meters of material used in the job were spoiled, the factory overhead rate has proven to be satisfactory, and an inexperienced employee performed the work.

### PR 17-4A Analyzing manufacturing cost accounts

OBJ. 2

Fire Rock Company manufactures designer paddle boards in a wide variety of sizes and styles. The following incomplete ledger accounts refer to transactions that are summarized for June:

✓ G. \$751,870

			Mate	erials		
June	1 30	Balance Purchases	82,500 330,000	June 30	Requisitions	(A)
			Work in	Process		
June	1 30 30 30	Balance Materials Direct labor Factory overhead applied	(B) (C) (D) (E)	June 30	Completed jobs	(F)
			Finished	d Goods		
June	1 30	Balance Completed jobs	0 (F)	June 30	Cost of goods sold	(G)
			Wages	Payable		
				June 30	Wages incurred	330,000
			Factory C	Overhead		
June	1 30 30 30	Balance Indirect labor Indirect materials Other overhead	33,000 (H) 44,000 237,500	June 30	Factory overhead applied	(E)

(Continued)

In addition, the following information is available:

a. Materials and direct labor were applied to six jobs in June:

Job No.	Style	Quantity	<b>Direct Materials</b>	<b>Direct Labor</b>
201	T100	550	\$ 55,000	\$ 41,250
202	T200	1,100	93,500	71,500
203	T400	550	38,500	22,000
204	S200	660	82,500	69,300
205	T300	480	60,000	48,000
206	S100	380	22,000	12,400
	Total	3,720	\$351,500	\$264,450

- b. Factory overhead is applied to each job at a rate of 140% of direct labor cost.
- c. The June 1 Work in Process balance consisted of two jobs, as follows:

		Work in Process,
Job No.	Style	June 1
Job 201	T100	\$16,500
Job 202	T200	44,000
Total		\$60,500

d. Customer jobs completed and units sold in June were as follows:

Job No.	Style	Completed in June	Units Sold in June
201	T100	X	440
202	T200	Χ	880
203	T400		0
204	S200	Χ	570
205	T300	Χ	420
206	S100		0

#### **Instructions**

1. Determine the missing amounts associated with each letter. Provide supporting calculations by completing a table with the following headings:

		June 1							Cost of
		Work in	Direct	Direct	Factory	Total	Unit	Units	Goods
Job No.	Quantity	Process	Materials	Labor	Overhead	Cost	Cost	Sold	Sold

2. Determine the June 30 balances for each of the inventory accounts and factory overhead.

#### PR 17-5A Flow of costs and income statement

OBJ. 2

Ginocera Inc. is a designer, manufacturer, and distributor of low-cost, high-quality stainless steel kitchen knives. A new kitchen knife series called the Kitchen Ninja was released for production in early 2016. In January, the company spent \$600,000 to develop a latenight advertising infomercial for the new product. During 2016, the company spent \$1,400,000 promoting the product through these infomercials, and \$800,000 in legal costs. The knives were ready for manufacture on January 1, 2016.

Ginocera uses a job order cost system to accumulate costs associated with the kitchen knife. The unit direct materials cost for the knife is:

Hardened steel blanks (used for knife shaft and blade)	\$4.00
Wood (for handle)	1.50
Packaging	0.50

The production process is straightforward. First, the hardened steel blanks, which are purchased directly from a raw material supplier, are stamped into a single piece of metal that includes both the blade and the shaft. The stamping machine requires one hour per 250 knives.

After the knife shafts are stamped, they are brought to an assembly area where an employee attaches the handle to the shaft and packs the knife into a decorative box. The direct labor cost is \$0.50 per unit.

✓ 1. Income from operations, \$432,000



The knives are sold to stores. Each store is given promotional materials, such as posters and aisle displays. Promotional materials cost \$60 per store. In addition, shipping costs average \$0.20 per knife.

Total completed production was 1,200,000 units during the year. Other information is as follows:

Number of customers (stores)	60,000
Number of knives sold	1,120,000
Wholesale price (to store) per knife	\$16

Factory overhead cost is applied to jobs at the rate of \$800 per stamping machine hour after the knife blanks are stamped. There were an additional 25,000 stamped knives, handles, and cases waiting to be assembled on December 31, 2016.

#### **Instructions**

- 1. Prepare an annual income statement for the Kitchen Ninja knife series, including supporting calculations, from the information provided.
- 2. Determine the balances in the work in process and finished goods inventories for the Kitchen Ninja knife series on December 31, 2016.

# **Problems: Series B**

#### PR 17-1B Entries for costs in a job order cost system

OBJ. 2

Royal Technology Company uses a job order cost system. The following data summarize the operations related to production for March:

- a. Materials purchased on account, \$770,000.
- b. Materials requisitioned, \$680,000, of which \$75,800 was for general factory use.
- c. Factory labor used, \$756,000, of which \$182,000 was indirect.
- d. Other costs incurred on account for factory overhead, \$245,000; selling expenses, \$171,500; and administrative expenses, \$110,600.
- e. Prepaid expenses expired for factory overhead were \$24,500; for selling expenses, \$28,420; and for administrative expenses, \$16,660.
- f. Depreciation of factory equipment was \$49,500; of office equipment, \$61,800; and of office building, \$14,900.
- g. Factory overhead costs applied to jobs, \$568,500.
- h. Jobs completed, \$1,500,000.
- i. Cost of goods sold, \$1,375,000.

#### Instruction

Journalize the entries to record the summarized operations.

#### PR 17-2B Entries and schedules for unfinished jobs and completed jobs

OBJ. 2

Hildreth Company uses a job order cost system. The following data summarize the operations related to production for April 2016, the first month of operations:

- a. Materials purchased on account, \$147,000.
- b. Materials requisitioned and factory labor used:

Job No.	Materials	<b>Factory Labor</b>
101	\$19,320	\$19,500
102	23,100	28,140
103	13,440	14,000
104	38,200	36,500
105	18,050	15,540
106	18,000	18,700
For general factory use	9,000	20,160

(Continued)

General Ledger



✓ 3. Work in Process balance, \$127,880

General Ledger



- c. Factory overhead costs incurred on account, \$6,000.
- d. Depreciation of machinery and equipment, \$4,100.
- e. The factory overhead rate is \$40 per machine hour. Machine hours used:

Job	<b>Machine Hours</b>
101	154
102	160
103	126
104	238
105	160
106	_174
Total	1,012

- f. Jobs completed: 101, 102, 103, and 105.
- g. Jobs were shipped and customers were billed as follows: Job 101, \$62,900; Job 102, \$80,700; Job 105, \$45,500.

#### **Instructions**

- 1. Journalize the entries to record the summarized operations.
- 2. Post the appropriate entries to T accounts for Work in Process and Finished Goods, using the identifying letters as transaction codes. Insert memo account balances as of the end of the month.
- 3. Prepare a schedule of unfinished jobs to support the balance in the work in process account.
- 4. Prepare a schedule of completed jobs on hand to support the balance in the finished goods account.

#### PR 17-3B Job order cost sheet

OBJ. 2, 3

Stretch and Trim Carpet Company sells and installs commercial carpeting for office buildings. Stretch and Trim Carpet Company uses a job order cost system. When a prospective customer asks for a price quote on a job, the estimated cost data are inserted on an unnumbered job cost sheet. If the offer is accepted, a number is assigned to the job, and the costs incurred are recorded in the usual manner on the job cost sheet. After the job is completed, reasons for the variances between the estimated and actual costs are noted on the sheet. The data are then available to management in evaluating the efficiency of operations and in preparing quotes on future jobs. On May 9, Stretch and Trim gave Lunden Consulting an estimate of \$18,044 to carpet the consulting firm's newly leased office. The estimate was based on the following data:

#### Estimated direct materials:

400 meters at \$32 per meter	\$12,800
Estimated direct labor:	
30 hours at \$20 per hour	600
Estimated factory overhead (80% of direct labor cost)	480
Total estimated costs	\$13,880
Markup (30% of production costs)	4,164
Total estimate	\$18,044

On May 10, Lunden Consulting signed a purchase contract, and the carpet was delivered and installed on May 15.

The related materials requisitions and time tickets are summarized as follows:

Materials Requisition No.	Description	Amount
132	360 meters at \$32	\$11,520
134	50 meters at \$32	1,600
Time Ticket No.	Description	Amount
H9	18 hours at \$19	\$342
H12	18 hours at \$19	342



#### **Instructions**

- 1. Complete that portion of the job order cost sheet that would be prepared when the estimate is given to the customer. (Round factory overhead applied to the nearest dollar.)
- 2. Record the costs incurred, and prepare a job order cost sheet. Comment on the reasons for the variances between actual costs and estimated costs. For this purpose, assume that the additional meters of material used in the job were spoiled, the factory overhead rate has proven to be satisfactory, and an inexperienced employee performed the work.

#### PR 17-4B Analyzing manufacturing cost accounts

OBJ. 2

Clapton Company manufactures custom guitars in a wide variety of styles. The following incomplete ledger accounts refer to transactions that are summarized for May:

# X

✓ G. \$700,284

			Mate	erials		
May	1	Balance	105,600	May 31	Requisitions	(A)
	31	Purchases	500,000			
			Work in	Process		
May	1	Balance	(B)	May 31	Completed jobs	(F)
	31	Materials	(C)			
	31	Direct labor	(D)			
	31	Factory overhead applied	(E)			
			Finished	d Goods		
May	1	Balance	0	May 31	Cost of goods sold	(G)
	31	Completed jobs	(F)			
			Wages	Payable		
				May 31	Wages incurred	396,000
			Factory C	Overhead		
May	1	Balance	26,400	May 31	Factory overhead applied	(E)
	31	Indirect labor	(H)			
	31	Indirect materials	15,400			
	31	Other overhead	122,500			

In addition, the following information is available:

a. Materials and direct labor were applied to six jobs in May:

Job No.	Style	Quantity	<b>Direct Materials</b>	<b>Direct Labor</b>
101	AF1	330	\$ 82,500	\$ 59,400
102	AF3	380	105,400	72,600
103	AF2	500	132,000	110,000
104	VY1	400	66,000	39,600
105	VY2	660	118,800	66,000
106	AF4	_330	66,000	30,800
	Total	2,600	\$570,700	\$378,400

- b. Factory overhead is applied to each job at a rate of 50% of direct labor cost.
- c. The May 1 Work in Process balance consisted of two jobs, as follows:

Job No.	Style	Work in Process, May 1
Job 101	AF1	\$26,400
Job 102	AF3	46,000
Total		\$72,400

(Continued)

d. Customer jobs completed and units sold in May were as follows:

Job No.	Style	Completed in May	Units Sold in May
101	AF1	Х	264
102	AF3	Χ	360
103	AF2		0
104	VY1	Χ	384
105	VY2	Χ	530
106	AF4		0

#### **Instructions**

1. Determine the missing amounts associated with each letter. Provide supporting calculations by completing a table with the following headings:

		May 1							Cost of
Job		Work in	Direct	Direct	Factory	Total	Unit	Units	Goods
No.	Quantity	Process	Materials	Labor	Overhead	Cost	Cost	Sold	Sold

2. Determine the May 31 balances for each of the inventory accounts and factory overhead.

#### PR 17-5B Flow of costs and income statement

OBJ. 2

Technology Accessories Inc. is a designer, manufacturer, and distributor of accessories for consumer electronic products. Early in 2016, the company began production of a leather cover for tablet computers, called the iLeather. The cover is made of stitched leather with a velvet interior and fits snuggly around most tablet computers. In January, \$750,000 was spent on developing marketing and advertising materials. For the first six months of 2016, the company spent \$1,400,000 promoting the iLeather. The product was ready for manufacture on January 21, 2016.

Technology Accessories Inc. uses a job order cost system to accumulate costs for the iLeather. Direct materials unit costs for the iLeather are as follows:

Leather	\$10.00
Velvet	5.00
Packaging	0.40
Total	\$15.40

The actual production process for the iLeather is fairly straightforward. First, leather is brought to a cutting and stitching machine. The machine cuts the leather and stitches an exterior edge into the product. The machine requires one hour per 125 iLeathers.

After the iLeather is cut and stitched, it is brought to assembly, where assembly personnel affix the velvet interior and pack the iLeather for shipping. The direct labor cost for this work is \$0.50 per unit.

The completed packages are then sold to retail outlets through a sales force. The sales force is compensated by a 20% commission on the wholesale price for all sales.

Total completed production was 500,000 units during the year. Other information is as follows:

Number of iLeather units sold in 2016	460,000
Wholesale price per unit	\$40

Factory overhead cost is applied to jobs at the rate of \$1,250 per machine hour. There were an additional 22,000 cut and stitched iLeathers waiting to be assembled on December 31, 2016.

#### **Instructions**

- 1. Prepare an annual income statement for the iLeather product, including supporting calculations, from the information provided.
- 2. Determine the balances in the finished goods and work in process inventories for the iLeather product on December 31, 2016.

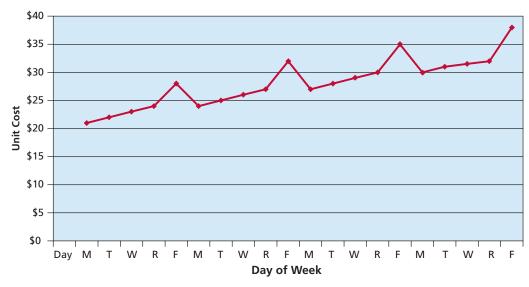
✓ 1. Income from operations, \$656,000



# **Cases & Projects**

#### CP 17-1 Managerial analysis

The controller of the plant of Minsky Company prepared a graph of the unit costs from the job cost reports for Product One. The graph appeared as follows:



How would you interpret this information? What further information would you request?

#### CP 17-2 Job order decision making and rate deficiencies

RIRA Company makes attachments, such as backhoes and grader and bulldozer blades, for construction equipment. The company uses a job order cost system. Management is concerned about cost performance and evaluates the job cost sheets to learn more about the cost effectiveness of the operations. To facilitate a comparison, the cost sheet for Job 206 (50 backhoe buckets completed in October) was compared with Job 228, which was for 75 backhoe buckets completed in December. The two job cost sheets follow:

Job 206

Item: 50 backhoe buckets						
Materials:	Direct Materials Quantity	×	Direct Materials Price	=	Amount	
Steel (tons)	105		\$1,200		\$126,000	
Steel components (pieces)	630		7		4,410	
Total materials					\$130,410	
Direct labor:	Direct Labor Hours	×	Direct Labor Rate	=	Amount	
Foundry	400		\$22.50		\$ 9,000	
Welding	550		27.00		14,850	
Shipping	_180		18.00		3,240	
Total direct labor	<u>1,130</u>				\$ 27,090	
	Direct Total Labor Cost	×	Factory Overhead Rate	=	Amount	
Factory overhead						
(200% of direct labor dollars)	\$27,090	×	200%		\$ 54,180	
Total cost					\$ 211,680	
Total units					÷ 50	
Unit cost (rounded)					\$4,233.60	
					(Continu	

(Continued)

Job 228

Item: 75 backhoe buckets						
Direct Materials Quantity	×	Direct Materials Price	=	Amount		
195		\$1,100		\$214,500		
945		7		6,615		
				\$221,115		
Direct Labor Hours	×	Direct Labor Rate	=	Amount		
750		\$22.50		\$ 16,875		
1,050		27.00		28,350		
375		18.00		6,750		
2,175				\$ 51,975		
Direct Total Labor Cost	×	Factory Overhead Rate	=	Amount		
\$51,975	×	200%		\$ 103,950 \$ 377,040 \(\ddot\) 75 \$5,027.20		
	Direct Materials Quantity  195 945  Direct Labor Hours  750 1,050 375 2,175  Direct Total Labor Cost	Direct Materials Quantity ×  195 945  Direct Labor Hours ×  750 1,050 375 2,175  Direct Total Labor Cost ×	Direct Materials Quantity         Direct Materials Price           195         \$1,100           945         7           Direct Labor Hours         Direct Labor Rate           750         \$22.50           1,050         27.00           375         18.00           2,175         Factory Overhead Rate	Direct Materials Quantity         Direct Materials Price         =           195         \$1,100         945         7           Direct Labor Hours         X         Direct Labor Rate         =           750         \$22.50         27.00         375         18.00           375         2,175         18.00         52.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175         2.175 <td< td=""></td<>		

Management is concerned with the increase in unit costs over the months from October to December. To understand what has occurred, management interviewed the purchasing manager and quality manager.

Purchasing Manager: Prices have been holding steady for our raw materials during the first half of the year. I found a new supplier for our bulk steel that was willing to offer a better price than we received in the past. I saw these lower steel prices and jumped at them, knowing that a reduction in steel prices would have a very favorable impact on our costs.

Quality Manager: Something happened around mid-year. All of a sudden, we were experiencing problems with respect to the quality of our steel. As a result, we've been having all sorts of problems on the shop floor in our foundry and welding operation.

1. Analyze the two job cost sheets, and identify why the unit costs have changed for the backhoe buckets. Complete the following schedule to help you in your analysis:

Item	Input Quantity per Unit—Job 206	Input Quantity per Unit—Job 228
Steel		
Foundry labor		
Welding labor		

2. How would you interpret what has happened in light of your analysis and the interviews?

#### **CP 17-3** Factory overhead rate

Salvo Inc., a specialized equipment manufacturer, uses a job order costing system. The overhead is allocated to jobs on the basis of direct labor hours. The overhead rate is now \$1,500 per direct labor hour. The design engineer thinks that this is illogical. The design engineer has stated the following:

Our accounting system doesn't make any sense to me. It tells me that every labor hour carries an additional burden of \$1,500. This means that direct labor makes up only 6% of our total product cost, yet it drives all our costs. In addition, these rates give my design engineers incentives to "design out" direct labor by using machine technology. Yet, over the past years as we have had less and less direct labor, the overhead rate keeps going up and up. I won't be surprised if next year the rate is \$2,000 per direct labor hour. I'm also concerned because small errors in our estimates of the direct labor content can have a large impact on our estimated costs. Just a 30-minute error in our

estimate of assembly time is worth \$750. Small mistakes in our direct labor time estimates really swing our bids around. I think this puts us at a disadvantage when we are going after business.

- 1. What is the engineer's concern about the overhead rate going "up and up"?
- 2. What did the engineer mean about the large overhead rate being a disadvantage when placing bids and seeking new business?
- What do you think is a possible solution?

## **CP 17-4** Recording manufacturing costs

Todd Lay just began working as a cost accountant for Enteron Industries Inc., which manufactures gift items. Todd is preparing to record summary journal entries for the month. Todd begins by recording the factory wages as follows:

> Wages Expense 60,000 Wages Payable 60,000

Then the factory depreciation:

Depreciation Expense—Factory Machinery 20.000

Accumulated Depreciation—Factory Machinery

20,000

Todd's supervisor, Jeff Fastow, walks by and notices the entries. The following conversation takes place:

Jeff: That's a very unusual way to record our factory wages and depreciation for the month.

Todd: What do you mean? This is exactly the way we were taught to record wages and depreciation in school. You know, debit an expense and credit Cash or payables, or in the case of depreciation, credit Accumulated Depreciation.

Jeff: Well, it's not the credits I'm concerned about. It's the debits—I don't think you've recorded the debits correctly. I wouldn't mind if you were recording the administrative wages or office equipment depreciation this way, but I've got real questions about recording factory wages and factory machinery depreciation this way.

Todd: Now I'm really confused. You mean this is correct for administrative costs, but not for factory costs? Well, what am I supposed to do—and why?

- 1. Play the role of Jeff and answer Todd's questions.
- Why would Jeff accept the journal entries if they were for administrative costs?

## **CP 17-5** Predetermined overhead rates

As an assistant cost accountant for Mississippi Industries, you have been assigned to review the activity base for the predetermined factory overhead rate. The president, Tony Favre, has expressed concern that the over- or underapplied overhead has fluctuated excessively over the years.

An analysis of the company's operations and use of the current overhead rate (direct labor cost) has narrowed the possible alternative overhead bases to direct labor cost and machine hours. For the past five years, the following data have been gathered:

	2016	2015	2014	2013	2012
Actual overhead	\$ 790,000	\$ 870,000	\$ 935,000	\$ 845,000	\$ 760,000
Applied overhead	777,000	882,000	924,000	840,000	777,000
(Over-) underapplied overhead	\$ 13,000	\$ (12,000)	\$ 11,000	\$ 5,000	\$ (17,000)
Direct labor cost	\$3,885,000	\$4,410,000	\$4,620,000	\$4,200,000	\$3,885,000
Machine hours	93,000	104,000	111,000	100,400	91,600

- 1. Calculate a predetermined factory overhead rate for each alternative base, assuming that rates would have been determined by relating the total amount of factory overhead for the past five years to the base.
- 2. For each of the past five years, determine the over- or underapplied overhead, based on the two predetermined overhead rates developed in part (1).
- Which predetermined overhead rate would you recommend? Discuss the basis for your recommendation.



# **Process Cost Systems**

# Dreyer's Ice Cream

In making ice cream, an electric ice cream maker is used to mix ingredients, which include milk, cream, sugar, and flavoring. After the ingredients are added, the mixer is packed with ice and salt to cool the ingredients, and it is then turned on.

After mixing for half of the required time, would you have ice cream? Of course not, because the ice cream needs to mix longer to freeze. Now, assume that you ask the question:

What costs have I incurred so far in making ice cream?

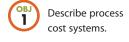
The answer to this question requires knowing the cost of the ingredients and electricity. The ingredients are added at the beginning; thus, all the ingredient costs have been incurred. Because the mixing is only half complete, only 50% of the electricity cost has been incurred. Therefore, the answer to the preceding question is:

All the materials costs and half the electricity costs have been incurred.

These same cost concepts apply to larger ice cream processes like those of **Dreyer's Ice Cream** (a subsidiary of **Nestlé**), manufacturer of Dreyer's and Edy's ice cream. Dreyer's mixes ingredients in 3,000-gallon vats in much the same way you would with an electric ice cream maker. Dreyer's also records the costs of the ingredients, labor, and factory overhead used in making ice cream. These costs are used by managers for decisions such as setting prices and improving operations.

This chapter describes and illustrates process cost systems that are used by manufacturers such as Dreyer's. In addition, the use of cost of production reports in decision making is described. Finally, lean manufacturing is discussed.

Learning Objectives				
After studying this chapter, you should be able to:	Example Exercises			
Describe process cost systems. Process Cost Systems Comparing Job Order and Process Cost Systems Cost Flows for a Process Manufacturer	EE 18-1			
Prepare a cost of production report. Cost of Production Report Step 1: Determine the Units to Be Assigned Costs Step 2: Compute Equivalent Units of Production Step 3: Determine the Cost per Equivalent Unit Step 4: Allocate Costs to Units Transferred Out and Partially Completed Units Preparing the Cost of Production Report	EE 18-2 EE 18-3, 18-4 EE 18-5 EE 18-6			
Journalize entries for transactions using a process cost system.  Journal Entries for a Process Cost System	EE 18-7			
Describe and illustrate the use of cost of production reports for decision making. Using the Cost of Production Report for Decision Making Frozen Delight Holland Beverage Company Yield	<b>EE</b> 18-8			
Compare lean manufacturing with traditional manufacturing processing.  Lean Manufacturing  Traditional Production Process  Lean Manufacturing				
At a Glo	ance 18 Page 859			



# **Process Cost Systems**

A process manufacturer produces products that are indistinguishable from each other using a continuous production process. For example, an oil refinery processes crude oil through a series of steps to produce a barrel of gasoline. One barrel of gasoline, the product, cannot be distinguished from another barrel. Other examples of process manufacturers include paper producers, chemical processors, aluminum smelters, and food processors.

# Integrity, Objectivity, and Ethics in Business



#### **ON BEING GREEN**

Process manufacturing often involves significant energy and material resources, which can be harmful to the environment. Thus, many process manufacturing companies, such as chemical, electronic, and metal processors, must address environmental issues. Companies, such as **DuPont**, **Intel**, **Apple**, and **Alcoa**, are at the forefront of providing environmental solutions for their products and processes.

For example, Apple provides free recycling programs for Macs®, iPhones®, and iPads®. Apple recovers more than 90% by weight of the original product in reusable components, glass, and plastic. You can even receive a free gift card for voluntarily recycling an older Apple product.

Source: Apple Web site.

The cost accounting system used by process manufacturers is called the **process cost system**. A process cost system records product costs for each manufacturing department or process.

In contrast, a job order manufacturer produces custom products for customers or batches of similar products. For example, a custom printer produces wedding invitations, graduation announcements, or other special print items that are tailored to the specifications of each customer. Each item manufactured is unique to itself. Other examples of job order manufacturers include furniture manufacturers, shipbuilders, and home builders.

As described and illustrated in Chapter 17, the cost accounting system used by job order manufacturers is called the *job order cost system*. A job order cost system records product cost for each job, using job cost sheets.

Some examples of process and job order companies and their products are shown in Exhibit 1.

Process Manufa	cturing Companies	ies Job Order Companies		
Company	Product	Company	Product	
Pepsi	soft drinks	Walt Disney	movies	
Alcoa	aluminum	Nike, Inc.	athletic shoes	
Intel	computer chip	Nicklaus Design	golf courses	
Apple	iPhone	Heritage Log Homes	log homes	
Hershey Foods	chocolate bars	DDB Advertising Agency	advertising	

# **EXHIBIT 1**

Examples of Process Cost and Job Order Companies

# **Comparing Job Order and Process Cost Systems**

Process and job order cost systems are similar in that each system:

- Records and summarizes product costs.
- Classifies product costs as direct materials, direct labor, and factory overhead.
- Allocates factory overhead costs to products.
- Uses perpetual inventory system for materials, work in process, and finished goods.
- Provides useful product cost information for decision making.

Process and job costing systems are different in several ways. As a basis for illustrating these differences, the cost systems for **Frozen Delight** and **Legend Guitars** are used.

Exhibit 2 illustrates the process cost system for Frozen Delight, an ice cream manufacturer. As a basis for comparison, Exhibit 2 also illustrates the job order cost system for Legend Guitars, a custom guitar manufacturer. Legend Guitars was described and illustrated in Chapters 16 and 17.

Exhibit 2 indicates that Frozen Delight manufactures ice cream, using two departments:

- The Mixing Department mixes the ingredients, using large vats.
- The Packaging Department puts the ice cream into cartons for shipping to customers.

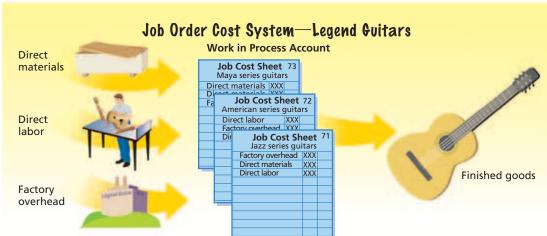
Because each gallon of ice cream is similar, product costs are recorded in each department's work in process account. As shown in Exhibit 2, Frozen Delight accumulates (records) the cost of making ice cream in *work in process accounts* for the Mixing and Packaging departments. The product costs of making a gallon of ice cream include:

Direct materials costs, which include milk, cream, sugar, and packing cartons. All materials costs are added at the beginning of the process for both the Mixing Department and the Packaging Department.

## **EXHIBIT 2**

#### **Process Cost and Job Order Cost Systems**





- *Direct labor costs*, which are incurred by employees in each department who run the equipment and load and unload product.
- Factory overhead costs, which include the utility costs (power) and depreciation on the equipment.

When the Mixing Department completes the mixing process, its product costs are transferred to the Packaging Department. When the Packaging Department completes its process, the product costs are transferred to Finished Goods. In this way, the cost of the product (a gallon of ice cream) accumulates across the entire production process.

In contrast, Exhibit 2 shows that Legend Guitars accumulates (records) product costs by jobs, using a job cost sheet for each type of guitar. Thus, Legend Guitars uses just one work in process account. As each job is completed, its product costs are transferred to Finished Goods.

In a job order cost system, the work in process at the end of the period is the sum of the job cost sheets for partially completed jobs. In a process cost system, the work in process at the end of the period is the sum of the costs remaining in each department account at the end of the period.

# Example Exercise 18-1 Job Order versus Process Costing

Which of the following industries would normally use job order costing systems, and which would normally use process costing systems?

> Home construction Computer chips

**Beverages** Cookies

Military aircraft Video game design and production

# Follow My Example 18-1

Home construction Job order **Process** Beverages Job order Military aircraft Computer chips **Process** Cookies **Process** Video game design and production Job order

Practice Exercises: PE 18-1A, PE 18-1B

# Cost Flows for a Process Manufacturer

Exhibit 3 illustrates the physical flow of materials for Frozen Delight. Ice cream is made in a manufacturing plant in much the same way you would make it at home, except on a larger scale.

# **EXHIBIT 3 Physical Flows for a Process Manufacturer Materials** Mixing **Packaging** Finished Goods Department Department Inventory Freezer

In the Mixing Department, direct materials in the form of milk, cream, and sugar are placed into a vat. An employee fills each vat, sets the cooling temperature, and sets the mix speed. The vat is cooled as the direct materials are being mixed by agitators (paddles). Factory overhead includes equipment depreciation and indirect materials.

In the Packaging Department, the ice cream is received from the Mixing Department in a form ready for packaging. The Packaging Department uses direct labor and factory overhead to package the ice cream into one-gallon containers. The ice cream is then transferred to finished goods, where it is frozen and stored in refrigerators prior to shipment to customers.

The cost flows in a process cost accounting system are similar to the physical flow of materials illustrated in Exhibit 3. The cost flows for Frozen Delight are illustrated in Exhibit 4 as follows:

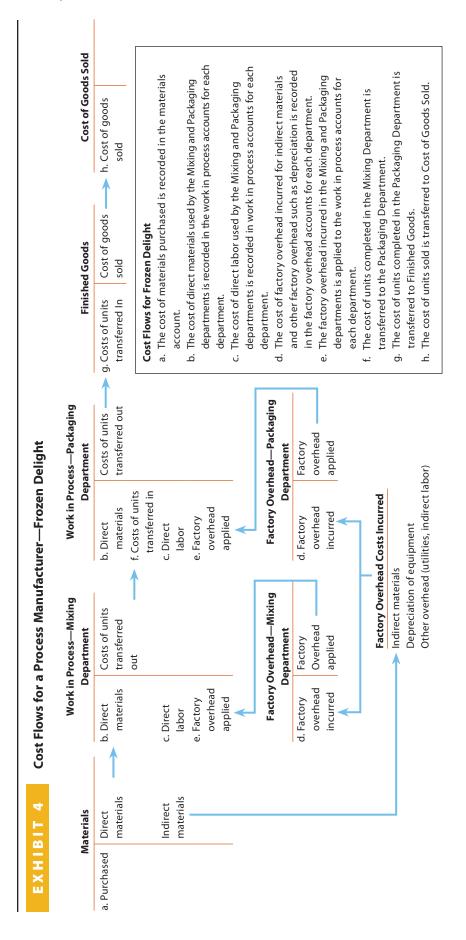


manufacturers.

Materials costs can be as high as 70% of the total product costs for many process

a. The cost of materials purchased is recorded in the materials account.

b. The cost of direct materials used by the Mixing and Packaging departments is recorded in the work in process accounts for each department.



- c. The cost of direct labor used by the Mixing and Packaging departments is recorded in work in process accounts for each department.
- d. The cost of factory overhead incurred for indirect materials and other factory overhead such as depreciation is recorded in the factory overhead accounts for each department.
- e. The factory overhead incurred in the Mixing and Packaging departments is applied to the work in process accounts for each department.
- f. The cost of units completed in the Mixing Department is transferred to the Packaging Department.
- g. The cost of units completed in the Packaging Department is transferred to Finished Goods.
- h. The cost of units sold is transferred to Cost of Goods Sold.

As shown in Exhibit 4, the Mixing and Packaging departments have separate factory overhead accounts. The factory overhead costs incurred for indirect materials, depreciation, and other overhead are debited to each department's factory overhead account. The overhead is applied to work in process by debiting each department's work in process account and crediting the department's factory overhead account.

Exhibit 4 illustrates how the Mixing and Packaging departments have separate work in process accounts. Each work in process account is debited for direct materials, direct labor, and applied factory overhead. In addition, the work in process account for the Packaging Department is debited for the cost of the units transferred in from the Mixing Department. Each work in process account is credited for the cost of the units transferred to the next department.

Lastly, Exhibit 4 shows that the finished goods account is debited for the cost of the units transferred from the Packaging Department. The finished goods account is credited for the cost of the units sold, which is debited to the cost of goods sold account.

# **Cost of Production Report**

In a process cost system, the cost of units transferred out of each processing department must be determined along with the cost of any partially completed units remaining in the department. The report that summarizes these costs is a cost of production report.

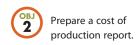
The **cost of production report** summarizes the production and cost data for a department as follows:

- The units the department is accountable for and the disposition of those units.
- The product costs incurred by the department and the allocation of those costs between completed (transferred out) and partially completed units.

A cost of production report is prepared using the following four steps:

- Step 1. Determine the units to be assigned costs.
- Step 2. Compute equivalent units of production.
- Step 3. Determine the cost per equivalent unit.
- Step 4. Allocate costs to units transferred out and partially completed units.

Preparing a cost of production report requires making a cost flow assumption. Like merchandise inventory, costs can be assumed to flow through the manufacturing process, using the first-in, first-out (FIFO), last in, first-out (LIFO), or average cost methods. Because the **first-in**, **first-out (FIFO) method** is often the same as the physical flow of units, the FIFO method is used in this chapter.¹



¹ The average cost method is illustrated in an appendix to this chapter.

To illustrate, a cost of production report for the Mixing Department of **Frozen Delight** for July 2016 is prepared. The July data for the Mixing Department are as follows:

Inventory in process, July 1, 5,000 gallons:		
Direct materials cost, for 5,000 gallons	\$5,000	
Conversion costs, for 5,000 gallons, 70% completed	1,225	
Total inventory in process, July 1		\$ 6,225
Direct materials cost for July, 60,000 gallons		66,000
Direct labor cost for July		10,500
Factory overhead applied for July		7,275
Total production costs to account for	!	\$90,000
Gallons transferred to Packaging in July (includes		
units in process on July 1), 62,000 gallons		?
Inventory in process, July 31, 3,000 gallons,		
25% completed as to conversion costs		?

By preparing a cost of production report, the cost of the gallons transferred to the Packaging Department in July and the ending work in process inventory in the Mixing Department are determined. These amounts are indicated by question marks (?).

# **Step 1: Determine the Units to Be Assigned Costs**

The first step is to determine the units to be assigned costs. A unit can be any measure of completed production, such as tons, gallons, pounds, barrels, or cases. For **Frozen Delight**, a unit is a gallon of ice cream.

The Mixing Department is accountable for 65,000 gallons of direct materials during July, computed as follows:

Total units (gallons) charged to production:

In process, July 1

Received from materials storage

Total units (gallons) accounted for

5,000 gallons

60,000

65,000 gallons

For July, the following three groups of units (gallons) are assigned costs:

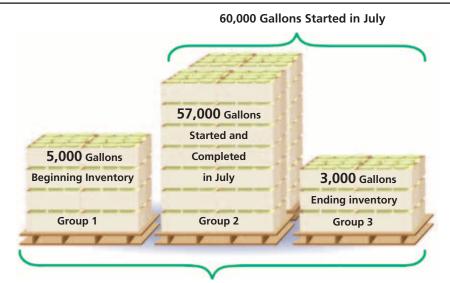
- Group 1. Units (gallons) in beginning work in process inventory on July 1.
- Group 2. Units (gallons) started and completed during July.
- Group 3. Units (gallons) in ending work in process inventory on July 31.

Exhibit 5 illustrates these groups of units (gallons) in the Mixing Department for July. The 5,000 gallons of beginning inventory were completed and transferred to the Packaging Department. During July, 60,000 gallons of material were started (entered into mixing). Of the 60,000 gallons started in July, 3,000 gallons were incomplete on July 31. Thus, 57,000 gallons (60,000 – 3,000) were started and completed in July.

The total units (gallons) to be assigned costs for July are summarized as follows:

Group 1	Inventory in process, July 1, completed in July	5,000 gallons
Group 2	Started and completed in July	57,000
	Transferred out to the Packaging Department in July	62,000 gallons
Group 3	Inventory in process, July 31	3,000
	Total units (gallons) to be assigned costs	65,000 gallons <b>←</b>

The total gallons to be assigned costs (65,000) equal the total gallons accounted for (65,000) by the Mixing Department.



# **EXHIBIT 5**

July Units to Be Costed—Mixing Department

65,000 Gallons to Be Assigned Costs

# Example Exercise 18-2 Units to Be Assigned Costs

(OBJ) **2** 

Rocky Springs Beverage Company has two departments, Blending and Bottling. The Bottling Department received 57,000 liters from the Blending Department. During the period, the Bottling Department completed 58,000 liters, including 4,000 liters of work in process at the beginning of the period. The ending work in process was 3,000 liters. How many liters were started and completed during the period?

# Follow My Example 18-2

54,000 liters started and completed (58,000 completed – 4,000 beginning work in process), or (57,000 started – 3,000 ending work in process)

.....

Practice Exercises: PE 18-2A, PE 18-2B

# **Step 2: Compute Equivalent Units of Production**

Whole units are the number of units in production during a period, whether completed or not. Equivalent units of production are the portion of whole units that are complete with respect to materials or conversion (direct labor and factory overhead) costs.

To illustrate, assume that a l,000-gallon batch (vat) of ice cream at **Frozen Delight** is only 40% complete in the mixing process on May 31. Thus, the batch is only 40% complete as to conversion costs such as power. In this case, the whole units and equivalent units of production are as follows:

	Whole Units	Equivalent Units
Materials costs	1,000 gallons	1,000 gallons
Conversion costs	1,000 gallons	400 gallons (1,000 × 40%)

Because the materials costs are all added at the beginning of the process, the materials costs are 100% complete for the 1,000-gallon batch of ice cream. Thus, the whole units and equivalent units for materials costs are 1,000 gallons. However, because the batch is only 40% complete as to conversion costs, the equivalent units for conversion costs are 400 gallons.

Equivalent units for materials and conversion costs are usually determined separately as shown earlier. This is because materials and conversion costs normally enter production at different times and rates. In contrast, direct labor and factory overhead normally enter production at the same time and rate. For this reason, direct labor and factory overhead are combined as conversion costs in computing equivalent units.

**Materials Equivalent Units** To compute equivalent units for materials, it is necessary to know how materials are added during the manufacturing process. In the case of **Frozen Delight**, all the materials are added at the beginning of the mixing process. Thus, the equivalent units for materials in July are computed as follows:

		Total Whole Units	Percent Materials Added in July	Equivalent Units for Direct Materials
Group 1	Inventory in process, July 1	5,000	0%	0
Group 2	Started and completed in July			
	(62,000 — 5,000)	57,000	100%	57,000
	Transferred out to Packaging			
	Department in July	62,000	_	57,000
Group 3	Inventory in process, July 31	3,000	100%	_3,000
	Total gallons to be assigned cost	65,000		60,000

As shown, the whole units for the three groups of units determined in Step 1 are listed in the first column. The percent of materials added in July is then listed. The equivalent units are determined by multiplying the whole units by the percent of materials added.

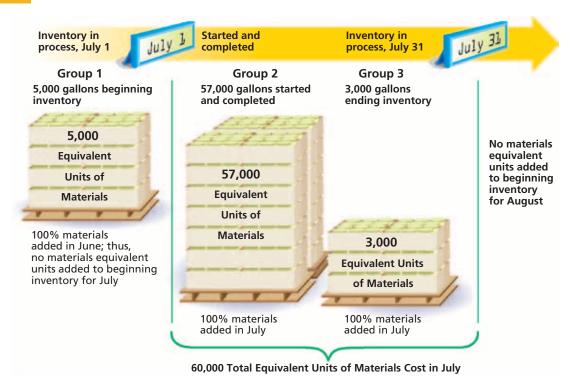
To illustrate, the July 1 inventory (Group 1) has 5,000 gallons of whole units, which are complete as to materials. That is, all the direct materials for the 5,000 gallons in process on July 1 were added in June. Thus, the percent of materials added in July is zero, and the equivalent units added in July are zero.

The 57,000 gallons started and completed in July (Group 2) are 100% complete as to materials. Thus, the equivalent units for the gallons started and completed in July are 57,000 (57,000  $\times$  100%) gallons. The 3,000 gallons in process on July 31 (Group 3) are also 100% complete as to materials because all materials are added at the beginning of the process. Therefore, the equivalent units for the inventory in process on July 31 are 3,000 (3,000  $\times$  100%) gallons.

The equivalent units for direct materials for **Frozen Delight** are summarized in Exhibit 6.

# EXHIBIT 6

# **Direct Materials Equivalent Units**



# Example Exercise 18-3 Equivalent Units of Materials Cost

ов **2** 

The Bottling Department of Rocky Springs Beverage Company had 4,000 liters in the beginning work in process inventory (30% complete). During the period, 58,000 liters were completed. The ending work in process inventory was 3,000 liters (60% complete). What are the total equivalent units for direct materials if materials are added at the beginning of the process?

# Follow My Example 18-3

Total equivalent units for direct materials are 57,000, computed as follows:

	Total Whole Units	Percent Materials Added in Period	Equivalent Units for Direct Materials
Inventory in process, beginning of period	4,000	0%	0
Started and completed during the period	54,000*	100%	54,000
Transferred out of Bottling (completed)	58,000	_	54,000
Inventory in process, end of period	3,000	100%	3,000
Total units to be assigned costs	61,000		57,000
*(58,000 – 4,000)			

Practice Exercises: PE 18-3A, PE 18-3B

**Conversion Equivalent Units** To compute equivalent units for conversion costs, it is necessary to know how direct labor and factory overhead enter the manufacturing process. Direct labor, utilities, and equipment depreciation are often incurred uniformly during processing. For this reason, it is assumed that **Frozen Delight** incurs conversion costs evenly throughout its manufacturing process. Thus, the equivalent units for conversion costs in July are computed as follows:

		Total Whole Units	Conversion Completed in July	Equivalent Units for Conversion
Group 1	Inventory in process, July 1 (70% completed)	5,000	30%	1,500
Group 2	Started and completed in July (62,000 – 5,000) Transferred out to Packaging	57,000	100%	57,000
	Department in July	62,000	_	58,500
Group 3	Inventory in process, July 31 (25% completed)  Total gallons to be assigned cost	3,000 65,000	25%	750 59,250

As shown, the whole units for the three groups of units determined in Step 1 are listed in the first column. The percent of conversion costs added in July is then listed. The equivalent units are determined by multiplying the whole units by the percent of conversion costs added.

To illustrate, the July 1 inventory has 5,000 gallons of whole units (Group 1), which are 70% complete as to conversion costs. During July, the remaining 30% (100% - 70%) of conversion costs was added. Therefore, the equivalent units of conversion costs added in July are 1,500  $(5,000 \times 30\%)$  gallons.

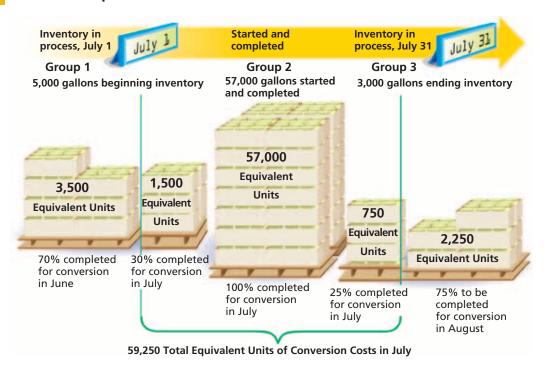
The 57,000 gallons started and completed in July (Group 2) are 100% complete as to conversion costs. Thus, the equivalent units of conversion costs for the gallons started and completed in July are  $57,000 (57,000 \times 100\%)$  gallons.

The 3,000 gallons in process on July 31 (Group 3) are 25% complete as to conversion costs. Hence, the equivalent units for the inventory in process on July 31 are 750 (3,000  $\times$  25%) gallons.

The equivalent units for conversion costs for **Frozen Delight** are summarized in Exhibit 7.

## **EXHIBIT 7**

#### **Conversion Equivalent Units**



# Example Exercise 18-4 Equivalent Units of Conversion Costs

OBJ 2

The Bottling Department of Rocky Springs Beverage Company had 4,000 liters in the beginning work in process inventory (30% complete). During the period, 58,000 liters were completed. The ending work in process inventory was 3,000 liters (60% complete). What are the total equivalent units for conversion costs?

# Follow My Example 18-4

	Total Whole Units	Percent Conversion Completed in Period	Equivalent Units for Conversion
Inventory in process, beginning of period	4,000	70%	2,800
Started and completed during the period	<u>54,000</u> *	100%	54,000
Transferred out of Bottling (completed)	58,000	_	56,800
Inventory in process, end of period	3,000	60%	1,800
Total units to be assigned costs	61,000		58,600
*(58,000 - 4,000)			

Practice Exercises: PE 18-4A, PE 18-4B

# **Step 3: Determine the Cost per Equivalent Unit**

The next step in preparing the cost of production report is to compute the cost per equivalent unit for direct materials and conversion costs. The **cost per equivalent unit** for direct materials and conversion costs is computed as follows:

 The July direct materials and conversion cost equivalent units for **Frozen Delight**'s Mixing Department from Step 2 are as follows:

Eguival		Hoite
Euuivai	ent	UIIILS

		Direct Materials	Conversion
Group 1	Inventory in process, July 1	0	1,500
Group 2	Started and completed in July (62,000 – 5,000)	57,000	57,000
	Transferred out to Packaging Department in July	57,000	58,500
Group 3	Inventory in process, July 31	3,000	750
	Total gallons to be assigned cost	60,000	59,250

The direct materials and conversion costs incurred by Frozen Delight in July are as follows:

Direct materials		\$66,000
Conversion costs:		
Direct labor	\$10,500	
Factory overhead	7,275	_17,775
Total product costs incurred in July		\$83,775

The direct materials and conversion costs per equivalent unit are \$1.10 and \$0.30 per gallon, computed as follows:

Direct Materials Cost per Equivalent Unit = 
$$\frac{\text{Total Direct Materials Cost for the Period}}{\text{Total Equivalent Units of Direct Materials}}$$
Direct Materials Cost per Equivalent Unit = 
$$\frac{\$66,000}{60,000 \text{ gallons}} = \$1.10 \text{ per gallon}$$
Conversion Cost per Equivalent Unit = 
$$\frac{\text{Total Conversion Costs for the Period}}{\text{Total Equivalent Units of Conversion Costs}}$$
Conversion Cost per Equivalent Unit = 
$$\frac{\$17,775}{59,250 \text{ gallons}} = \$0.30 \text{ per gallon}$$

The preceding costs per equivalent unit are used in Step 4 to allocate the direct materials and conversion costs to the completed and partially completed units.

# Example Exercise 18-5 Cost per Equivalent Unit



The cost of direct materials transferred into the Bottling Department of Rocky Springs Beverage Company is \$22,800. The conversion cost for the period in the Bottling Department is \$8,790. The total equivalent units for direct materials and conversion are 57,000 liters and 58,600 liters, respectively. Determine the direct materials and conversion costs per equivalent unit.

# Follow My Example 18-5

Direct Materials Cost per Equivalent Unit = 
$$\frac{$22,800}{57,000 \text{ liters}}$$
 = \$0.40 per liter

Conversion Cost per Equivalent Unit =  $\frac{$8,790}{58,600 \text{ liters}}$  = \$0.15 per liter

Practice Exercises: PE 18-5A, PE 18-5B

# **Step 4: Allocate Costs to Units Transferred Out and Partially Completed Units**

Product costs must be allocated to the units transferred out and the partially completed units on hand at the end of the period. The product costs are allocated using the costs per equivalent unit for materials and conversion costs that were computed in Step 3.

The total production costs to be assigned for **Frozen Delight** in July are \$90,000, computed as follows:

Inventory in process, July 1, 5,000 gallons:	
Direct materials cost, for 5,000 gallons	\$ 5,000
Conversion costs, for 5,000 gallons, 70% completed	1,225
Total inventory in process, July 1	\$ 6,225
Direct materials cost for July, 60,000 gallons	66,000
Direct labor cost for July	10,500
Factory overhead applied for July	7,275
Total production costs to account for	\$90,000

The units to be assigned these costs follow. The costs to be assigned these units are indicated by question marks (?).

		Units	Total Cost
Group 1	Inventory in process, July 1, completed in July	5,000 gallons	?
Group 2	Started and completed in July	57,000	?
	Transferred out to the Packaging		
	Department in July	62,000 gallons	?
Group 3	Inventory in process, July 31	3,000	?
	Total	65,000 gallons	\$90,000

**Group 1: Inventory in Process on July 1** The 5,000 gallons of inventory in process on July 1 (Group 1) were completed and transferred out to the Packaging Department in July. The cost of these units of \$6,675 is determined as follows:

	Direct Materials	Conversion	Total
	Costs	Costs	Costs
Inventory in process, July 1 balance			\$6,225
Equivalent units for completing the			
July 1 in-process inventory	0	1,500	
Cost per equivalent unit	× \$1.10	× \$0.30	
Cost of completed July 1 in-process inventory	0	\$450	450
Cost of July 1 in-process inventory			
transferred to Packaging Department			\$6,675

As shown, \$6,225 of the cost of the July 1 in-process inventory of 5,000 gallons was carried over from June. This cost plus the cost of completing the 5,000 gallons in July was transferred to the Packaging Department during July. The cost of completing the 5,000 gallons during July is \$450. The \$450 represents the conversion costs necessary to complete the remaining 30% of the processing. There were no direct materials costs added in July because all the materials costs had been added in June. Thus, the cost of the 5,000 gallons in process on July 1 (Group 1) transferred to the Packaging Department is \$6,675.

**Group 2: Started and Completed** The 57,000 units started and completed in July (Group 2) incurred all (100%) of their direct materials and conversion costs in July. Thus, the cost of the 57,000 gallons started and completed is \$79,800, computed by multiplying 57,000 gallons by the costs per equivalent unit for materials and conversion costs as follows:

	Direct Materials	Conversion	Total
	Costs	Costs	Costs
Units started and completed in July	57,000 gallons	57,000 gallons	
Cost per equivalent unit	× \$1.10	× \$0.30	
Cost of the units started			
and completed in July	\$62,700	\$17,100	\$79,800

The total cost of \$86,475 transferred to the Packaging Department in July is the sum of the beginning inventory cost and the costs of the units started and completed in July, computed as follows:

Group 1	Cost of July 1 in-process inventory	\$ 6,675
Group 2	Cost of the units started and completed in July	79,800
	Total costs transferred to Packaging Department in July	\$86,475

**Group 3: Inventory in Process on July 31** The 3,000 gallons in process on July 31 (Group 3) incurred all their direct materials costs and 25% of their conversion costs in July. The cost of these partially completed units of \$3,525 is computed as follows:

	Direct Materials Costs	Conversion Costs	Total Costs
Equivalent units in ending inventory	3,000 gallons	750 gallons	
Cost per equivalent unit	× \$1.10	× \$0.30	
Cost of July 31 in-process inventory	\$3,300	\$225	\$3,525

The 3,000 gallons in process on July 31 received all (100%) of their materials in July. Therefore, the direct materials cost incurred in July is \$3,300 (3,000  $\times$  \$1.10). The conversion costs of \$225 represent the cost of the 750 (3,000  $\times$  25%) equivalent gallons multiplied by the cost of \$0.30 per equivalent unit for conversion costs. The sum of the direct materials cost (\$3,300) and the conversion costs (\$225) equals the total cost of the July 31 work in process inventory of \$3,525 (\$3,300 + \$225).

To summarize, the total manufacturing costs for Frozen Delight in July were assigned as follows. In doing so, the question marks (?) for the costs to be assigned to units in Groups 1, 2, and 3 have been answered.

		Units	Total Cost
Group 1	Inventory in process, July 1, completed in July	5,000 gallons	\$ 6,675
Group 2	Started and completed in July	57,000	79,800
	Transferred out to the Packaging		
	Department in July	62,000 gallons	\$86,475
Group 3	Inventory in process, July 31	3,000	3,525
	Total	65,000 gallons	\$90,000

# Example Exercise 18-6 Cost of Units Transferred Out and Ending Work in Process

**ОВ**Ј **2** 

The costs per equivalent unit of direct materials and conversion in the Bottling Department of Rocky Springs Beverage Company are \$0.40 and \$0.15, respectively. The equivalent units to be assigned costs are as follows:

	Equivalent Units	
	<b>Direct Materials</b>	Conversion
Inventory in process, beginning of period	0	2,800
Started and completed during the period	54,000	54,000
Transferred out of Bottling (completed)	54,000	56,800
Inventory in process, end of period	3,000	1,800
Total units to be assigned costs	57,000	58,600

The beginning work in process inventory had a cost of \$1,860. Determine the cost of units transferred out and the ending work in process inventory.

# Follow My Example 18-6

	Direct Materials Costs		Conversion Costs	Total Costs
Inventory in process, beginning of period				\$ 1,860
Inventory in process, beginning of period	0	+	2,800 × \$0.15	420
Started and completed during the period	54,000 × \$0.40	+	54,000 × \$0.15	29,700
Transferred out of Bottling (completed)				\$31,980
Inventory in process, end of period	$3,000 \times \$0.40$	+	1,800 × \$0.15	1,470
Total costs assigned by the Bottling Department				\$33,450
Completed and transferred out of production	\$31,980			
Inventory in process, ending	\$ 1,470			

Practice Exercises: PE 18-6A, PE 18-6B

# **Preparing the Cost of Production Report**

A cost of production report is prepared for each processing department at periodic intervals. The report summarizes the following production quantity and cost data:

- The units for which the department is accountable and the disposition of those units
- The production costs incurred by the department and the allocation of those costs between completed (transferred out) and partially completed units

Using Steps 1–4, the July cost of production report for **Frozen Delight**'s Mixing Department is shown in Exhibit 8. During July, the Mixing Department was accountable for 65,000 units (gallons). Of these units, 62,000 units were completed and transferred to the Packaging Department. The remaining 3,000 units are partially completed and are part of the in-process inventory as of July 31.

The Mixing Department was responsible for \$90,000 of production costs during July. The cost of goods transferred to the Packaging Department in July was \$86,475. The remaining cost of \$3,525 is part of the in-process inventory as of July 31.

# **EXHIBIT 8**

# Cost of Production Report for Frozen Delight's Mixing Department—FIFO

	A	В	С	D	E				
1		Frozen Delight							
2									
3		Nonth Ended July 3				– Step 1			
4	4								
5		Whole Units	Equivale	ent Units		Step 2			
	UNITS		Direct Materials	Conversion					
7	Units charged to production:								
8	Inventory in process, July 1	5,000							
9	Received from materials storeroom	60,000							
10	Total units accounted for by the Mixing Department	65,000							
11	, , , ,								
12	Units to be assigned costs:								
13		5,000	0	1,500					
14	Started and completed in July	57,000	57,000	57,000					
15	Transferred to Packaging Department in July	62,000	57,000	58,500					
16	Inventory in process, July 31 (25% completed)	3,000	3,000	750					
17	Total units to be assigned costs	65,000	60,000	59,250					
18									
19				Costs					
20	COSTS		Direct Materials	Conversion	Total				
21									
22	Costs per equivalent unit:								
23	Total costs for July in Mixing Department		\$ 66,000	\$ 17,775					
24	Total equivalent units (from Step 2)		÷60,000	÷59,250					
25	Cost per equivalent unit		\$ 1.10	\$ 0.30					
26						-Step 3			
27	Costs assigned to production:								
28	Inventory in process, July 1				\$ 6,225				
29	Costs incurred in July				83,775 ^a				
30	Total costs accounted for by the Mixing Department				\$90,000				
31									
32									
33	Cost allocated to completed and partially								
34	completed units:								
35	Inventory in process, July 1—balance				\$ 6,225				
36	To complete inventory in process, July 1		\$ 0	+ \$ 450 ^b	= 450				
37	Cost of completed July 1 work in process				\$ 6,675	- Step 4			
38	Started and completed in July		62,700 ^c	+ 17,100 ^d	= 79,800				
39	Transferred to Packaging Department in July				\$86,475				
40	Inventory in process, July 31		\$ 3,300 ^e	+ \$ 225 ^f	= 3,525				
41	Total costs assigned by the Mixing Department				\$90,000	J			
42									

 $^{^{}a}$ \$66,000 + \$10,500 + \$7,275 = \$83,775  b 1,500 units  $\times$  \$0.30 = \$450  c 57,000 units  $\times$  \$1.10 = \$62,700  d 57,000 units  $\times$  \$0.30 = \$17,100  e 3,000 units  $\times$  \$1.10 = \$3,300  f 750 units  $\times$  \$0.30 = \$225

# **Journal Entries for a Process Cost System**

Journalize entries for transactions using a process cost system.

The journal entries to record the cost flows and transactions for a process cost system are illustrated in this section. As a basis for illustration, the July transactions for **Frozen Delight** are used. To simplify, the entries are shown in summary form, even though many of the transactions would be recorded daily.

a. Purchased materials, including milk, cream, sugar, packaging, and indirect materials on account, \$88,000.

a. Materials 88,000 Accounts Payable 88,000			a.			88,000	88,000	
---------------------------------------------	--	--	----	--	--	--------	--------	--

b. The Mixing Department requisitioned milk, cream, and sugar, \$66,000. This is the total amount from the original July data. Packaging materials of \$8,000 were requisitioned by the Packaging Department. Indirect materials for the Mixing and Packaging departments were \$4,125 and \$3,000, respectively.

b.	Work in Process—Mixing Work in Process—Packaging Factory Overhead—Mixing	66,000 8,000 4,125		
	Factory Overhead—Packaging Materials	3,000	81,125	

c. Incurred direct labor in the Mixing and Packaging departments of 10,500 and 12,000, respectively.

C.	Work in Process—Mixing Work in Process—Packaging	10,500 12,000		
	Wages Payable	12,000	22,500	

d. Recognized equipment depreciation for the Mixing and Packaging departments of \$3,350 and \$1,000, respectively.

	d.	Factory Overhead—Mixing Factory Overhead—Packaging	3,350 1,000		
		Accumulated Depreciation—Equipment	,,,,,,	4,350	

e. Applied factory overhead to Mixing and Packaging departments of \$7,275 and \$3,500, respectively.

	e.	Work in Process—Mixing	7,275		
		Work in Process—Packaging	3,500		
		Factory Overhead—Mixing		7,275	
		Factory Overhead—Packaging		3,500	

f. Transferred costs of \$86,475 from the Mixing Department to the Packaging Department per the cost of production report in Exhibit 8.

f. Work in Process—Packaging Work in Process—Mixing		86,475	86,475	
-----------------------------------------------------	--	--------	--------	--

g. Transferred goods of \$106,000 out of the Packaging Department to Finished Goods according to the Packaging Department cost of production report (not illustrated).

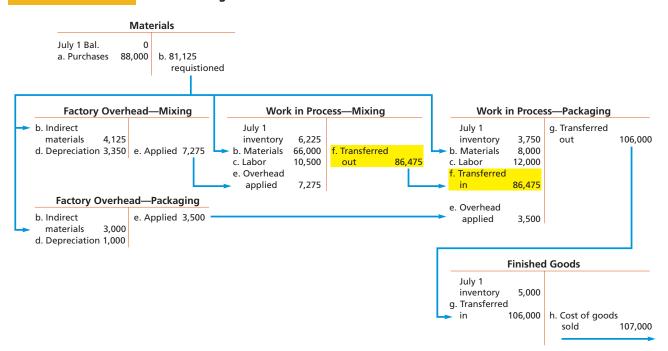
	g.	Finished Goods—Ice Cream Work in Process—Packaging		106,000	106,000	
--	----	-------------------------------------------------------	--	---------	---------	--

h. Recorded the cost of goods sold out of the finished goods inventory of \$107,000.



Exhibit 9 shows the flow of costs for each transaction. The highlighted amounts in Exhibit 9 were determined from assigning the costs in the Mixing Department. These amounts were computed and are shown at the bottom of the cost of production report for the Mixing Department in Exhibit 8. Likewise, the amount transferred out of the Packaging Department to Finished Goods would have also been determined from a cost of production report for the Packaging Department.

# **EXHIBIT 9** Frozen Delight's Cost Flows



The ending inventories for Frozen Delight are reported on the July 31 balance sheet as follows:

Materials	\$ 6,875
Work in Process—Mixing Department	3,525
Work in Process—Packaging Department	7,725
Finished Goods	4,000
Total inventories	\$22,125

The \$3,525 balance of Work in Process—Mixing Department is the amount determined from the bottom of the cost of production report in Exhibit 8.

# Example Exercise 18-7 Process Cost Journal Entries

The cost of materials transferred into the Bottling Department of Rocky Springs Beverage Company is \$22,800, including \$20,000 from the Blending Department and \$2,800 from the materials storeroom. The conversion cost for the period in the Bottling Department is \$8,790 (\$3,790 factory overhead applied and \$5,000 direct labor). The total cost transferred to Finished Goods for the period was \$31,980. The Bottling Department had a beginning inventory of \$1,860.

- a. Journalize (1) the cost of transferred-in materials, (2) conversion costs, and (3) the costs transferred out to Finished Goods.
- b. Determine the balance of Work in Process—Bottling at the end of the period.

Follow My Example 18-7			
a. 1. Work in Process—Bottling	22.800		
Work in Process—Blending	22,000	20.000	
Materials		2,800	
2. Work in Process—Bottling	8,790	·	
Factory Overhead—Bottling		3,790	
Wages Payable		5,000	
3. Finished Goods	31,980		
Work in Process—Bottling		31,980	
b. \$1,470 (\$1,860 + \$22,800 + \$8,790 - \$31,980)			

Practice Exercises: PE 18-7A, PE 18-7B

# Service Focus



### COSTING THE POWER STACK

Process costing can also be used in service businesses where the nature of the service is uniform across all units. Examples include electricity generation, wastewater treatment, and natural gas transmission. To illustrate, in generating electricity, the unit of production is called a megawatt hour, where each megawatt hour is the same across all sources of generation.

Unlike product manufacturing, service companies often do not have inventory. For example, in generating electricity, the electricity cannot be stored. Thus, electric companies such as Duke Energy Corporation match the production of electricity to the demand in real time. Electric companies use what is called the *power stack* to match power supply to demand by arranging generating facilities in order of cost per megawatt hour. The least cost per megawatt hour facilities satisfy initial demand at the bottom of the stack, while the highest cost per megawatt hour power sources are placed at top of the stack to satisfy peak loads, as illustrated in the following graph:



The cost per megawatt hour is determined using process costing by accumulating the conversion costs such as equipment depreciation, labor, and maintenance plus the cost of fuel for each facility. These costs are divided by the megawatt hours generated. Because there are no inventories, the additional complexity of equivalent units is avoided. The resulting cost per megawatt hour by facility is used to develop the power stack.



# **Using the Cost of Production Report for Decision Making**

The cost of production report is often used by managers for decisions involving the control and improvement of operations. To illustrate, cost of production reports for **Frozen Delight** and **Holland Beverage Company** are used. Finally, the computation and use of yield are discussed.

# **Frozen Delight**

The cost of production report for the Mixing Department is shown in Exhibit 8. The cost per equivalent unit for June can be determined from the beginning inventory. The original Frozen Delight data indicate that the July 1 inventory in process of \$6,225 consists of the following costs:

Direct materials cost, 5,000 gallons	\$5,000
Conversion costs, 5,000 gallons, 70% completed	1,225
Total inventory in process, July 1	\$6,225

Using the preceding data, the June costs per equivalent unit of materials and conversion costs can be determined as follows:

Direct Materials Cost per Equivalent Unit 
$$=$$
  $\frac{\text{Total Direct Materials Cost for the Period}}{\text{Total Equivalent Units of Direct Materials}}$ 

Direct Materials Cost per Equivalent Unit  $=$   $\frac{\$5,000}{5,000 \text{ gallons}} = \$1.00 \text{ per gallon}}$ 

Conversion Cost per Equivalent Unit  $=$   $\frac{\text{Total Conversion Costs for the Period}}{\text{Total Equivalent Units of Conversion Costs}}$ 

Conversion Cost per Equivalent Unit  $=$   $\frac{\$1,225}{(5,000 \times 70\%) \text{ gallons}} = \$0.35 \text{ per gallon}}$ 

In July, the cost per equivalent unit of materials increased by \$0.10 per gallon, while the cost per equivalent unit for conversion costs decreased by \$0.05 per gallon, computed as follows:

			Increase
	July*	June	(Decrease)
Cost per equivalent unit for direct materials	\$1.10	\$1.00	\$0.10
Cost per equivalent unit for conversion costs	0.30	0.35	(0.05)
*From Exhibit 8			

Frozen Delight's management could use the preceding analysis as a basis for investigating the increase in the direct materials cost per equivalent unit and the decrease in the conversion cost per equivalent unit.

# **Holland Beverage Company**

A cost of production report may be prepared showing more cost categories beyond just direct materials and conversion costs. This greater detail can help managers isolate problems and seek opportunities for improvement.

To illustrate, the Blending Department of Holland Beverage Company prepared cost of production reports for April and May. To simplify, assume that the Blending Department had no beginning or ending work in process inventory in either month. That is,

all units started were completed in each month. The cost of production reports showing multiple cost categories for April and May in the Blending Department are as follows:

	А	В	С		
1	Cost of Production Reports				
2	Holland Beverage Com				
3	For the Months Ende	d April 30 and Ma	ay 31, 2016		
4		May			
5	Direct materials	\$ 20,000	\$ 40,600		
6	Direct labor	15,000	29,400		
7	Energy	8,000	20,000		
8	Repairs	4,000	8,000		
9	Tank cleaning	3,000	8,000		
10	Total	\$ 50,000	\$106,000		
11	Units completed	÷100,000	÷200,000		
12	Cost per unit	\$ 0.50	\$ 0.53		
13					

The May results indicate that total unit costs have increased from \$0.50 to \$0.53, or 6% in May. To determine the possible causes for this increase, the cost of production report is restated in per-unit terms by dividing the costs by the number of units completed, as follows:

	А	В	С	D		
1	Blending Department					
2	Per-Unit E	xpense Con	nparisons			
3		April	May	% Change		
4	Direct materials	\$0.200	\$0.203	1.50%		
5	Direct labor	0.150	0.147	-2.00%		
6	Energy	0.080	0.100	25.00%		
7	Repairs	0.040	0.040	0.00%		
8	Tank cleaning	0.030	0.040	33.33%		
9	Total	\$0.500	\$0.530	6.00%		
10						

Both energy and tank cleaning per-unit costs have increased significantly in May. These increases should be further investigated. For example, the increase in energy may be due to the machines losing fuel efficiency. This could lead management to repair the machines. The tank cleaning costs could be investigated in a similar fashion.

# **Yield**

In addition to unit costs, managers of process manufacturers are also concerned about yield. The **yield** is computed as follows:

$$Yield = \frac{Quantity of Material Output}{Quantity of Material Input}$$

To illustrate, assume that 1,000 pounds of sugar enter the Packaging Department, and 980 pounds of sugar were packed. The yield is 98%, computed as follows:

Yield = 
$$\frac{\text{Quantity of Material Output}}{\text{Quantity of Material Input}} = \frac{980 \text{ pounds}}{1,000 \text{ pounds}} = 98\%$$

Thus, two percent (100% - 98%) or 20 pounds of sugar were lost or spilled during the packing process. Managers can investigate significant changes in yield over time or significant differences in yield from industry standards.

# Example Exercise 18-8 Using Process Costs for Decision Making



The cost of energy consumed in producing good units in the Bottling Department of Rocky Springs Beverage Company was \$4,200 and \$3,700 for March and April, respectively. The number of equivalent units produced in March and April was 70,000 liters and 74,000 liters, respectively. Evaluate the change in the cost of energy between the two months.

# Follow My Example 18-8

Energy cost per liter, March = 
$$\frac{$4,200}{70,000 \text{ liters}}$$
 = \$0.06

Energy cost per liter, April = 
$$\frac{\$3,700}{74,000 \text{ liters}} = \$0.05$$

The cost of energy has improved by 1 cent per liter between March and April.

Practice Exercises: PE 18-8A, PE 18-8B



# **Lean Manufacturing**

The objective of most manufacturers is to produce products with high quality, low cost, and instant availability. In attempting to achieve this objective, many manufacturers have implemented lean manufacturing (or just-in-time processing). **Lean manufacturing** is a management approach that produces products with high quality, low cost, fast response, and immediate availability. Lean manufacturing obtains efficiencies and flexibility by reorganizing the traditional production process.

# **Traditional Production Process**

A traditional manufacturing process for a furniture manufacturer is shown in Exhibit 10. The product (chair) moves through seven processes. In each process, workers are assigned a specific job, which is performed repeatedly as unfinished products are received from the preceding department. The product moves from process to process as each function or step is completed.

# **EXHIBIT 10**

### **Traditional Production Line**



For the furniture maker in Exhibit 10, the product (chair) moves through the following processes:

- 1. In the Cutting Department, the wood is cut to design specifications.
- 2. In the Drilling Department, the wood is drilled to design specifications.
- 3. In the Sanding Department, the wood is sanded.
- 4. In the Staining Department, the wood is stained.
- 5. In the Varnishing Department, varnish and other protective coatings are applied.

- 6. In the Upholstery Department, fabric and other materials are added.
- 7. In the Assembly Department, the product (chair) is assembled.

In the traditional production process, supervisors enter materials into manufacturing so as to keep all the manufacturing departments (processes) operating. Some departments, however, may process materials more rapidly than others. In addition, if one department stops because of machine breakdowns, for example, the preceding departments usually continue production in order to avoid idle time. In such cases, a buildup of work in process inventories results in some departments.

# **Lean Manufacturing**

In lean manufacturing, processing functions are combined into work centers, sometimes called **manufacturing cells**. For example, the seven departments illustrated in Exhibit 10 might be reorganized into the following three work centers:

- 1. Work Center 1 performs the cutting, drilling, and sanding functions.
- 2. Work Center 2 performs the staining and varnishing functions.
- 3. Work Center 3 performs the upholstery and assembly functions.

The preceding lean manufacturing process is illustrated in Exhibit 11.

# EXHIBIT 11 Lear

### **Lean Production Line**



In traditional manufacturing, a worker typically performs only one function. However, in lean manufacturing, work centers complete several functions. Thus, workers are often cross-trained to perform more than one function. Research has indicated that workers who perform several functions identify better with the end product. This creates pride in the product and improves quality and productivity.

The activities supporting the manufacturing process are called *service activities*. For example, repair and maintenance of manufacturing equipment are service activities. In lean manufacturing, service activities may be assigned to individual work centers, rather than to centralized service departments. For example, each work center may be assigned responsibility for the repair and maintenance of its machinery and equipment. This creates an environment in which workers gain a better understanding of the production process and their machinery. In turn, workers tend to take better care of the machinery, which decreases repairs and maintenance costs, reduces machine downtime, and improves product quality.

In lean manufacturing, the product is often placed on a movable carrier that is centrally located in the work center. After the workers in a work center have completed their activities with the product, the entire carrier and any additional materials are moved just in time to satisfy the demand or need of the next work center. In this sense, the product is said to be "pulled through." Each work center is connected to other work centers through information contained on a Kanban, which is a Japanese term for cards.

In summary, the primary objective of lean manufacturing is to increase the speed and quality, while reducing the cost of operations. This is achieved by eliminating waste and simplifying the production process. Lean manufacturing, including lean accounting and activity analysis, are further described and illustrated in Chapter 27.



Before Caterpillar implemented JIT, a transmission

traveled 10 miles through the factory and required 1,000 pieces of paper to support the manufacturing process. After implementing JIT, a transmission travels only 200 feet and requires only 10 pieces of paper.



# Business Connection

# RADICAL IMPROVEMENT: JUST IN TIME FOR PULASKI'S CUSTOMERS

Pulaski Furniture Corporation embraced lean manufacturing principles and revolutionized its business. The company wanted to "be easier to do business with" by offering its customers smaller shipments more frequently. It was able to accomplish this by taking the following steps:

- Mapping processes to properly align labor, machines, and materials
- Eliminating 100 feet of conveyor line

- Moving machines into manufacturing cells
- Reducing manufacturing run sizes by simplifying the product design
- Making every product more frequently in order to reduce the customer's waiting time for a product

As a result of these lean manufacturing changes, the company significantly improved its inventory position while simultaneously improving its shipping times to the customer. Its lumber inventory was reduced by 25%, finished goods inventory was reduced by 40%, and work in process inventory was reduced by 50%. At the same time, customers' shipment waiting times were shortened from months to weeks.

Source: Jeff Linville, "Pulaski's Passion for Lean Plumps up Dealer Service," Furniture Today, June 2006.

#### X $|\mathbb{I}|$

# **Average Cost Method**

A cost flow assumption must be used as product costs flow through manufacturing processes. In this chapter, the first-in, first-out cost flow method was used for the Mixing Department of Frozen Delight. In this appendix, the average cost flow method is illustrated for S&W Ice Cream Company (S&W).

# Determining Costs Using the Average Cost Method

S&W's operations are similar to those of Frozen Delight. Like Frozen Delight, S&W mixes direct materials (milk, cream, sugar) in refrigerated vats and has two manufacturing departments, Mixing and Packaging.

The manufacturing data for the Mixing Department for July 2016 are as follows:

Inventory in process, July 1, 5,000 gallons (70% completed)	\$ 6,200
Direct materials cost incurred in July, 60,000 gallons	66,000
Direct labor cost incurred in July	10,500
Factory overhead applied in July	6,405
Total production costs to account for	\$89,105
Cost of goods transferred to Packaging in July (includes units	
in process on July 1), 62,000 gallons	?
Cost of work in process inventory, July 31, 3,000 gallons,	
25% completed as to conversion costs	?

Using the average cost method, the objective is to allocate the total costs of production of \$89,105 to the following:

- The 62,000 gallons completed and transferred to the Packaging Department
- The 3,000 gallons in the July 31 (ending) work in process inventory

The preceding costs show two question marks. These amounts are determined by preparing a cost of production report, using the following four steps:

- Step 1. Determine the units to be assigned costs.
- Step 2. Compute equivalent units of production.
- Step 3. Determine the cost per equivalent unit.
- Step 4. Allocate costs to transferred out and partially completed units.

Under the average cost method, all production costs (materials and conversion costs) are combined together for determining equivalent units and cost per equivalent unit.

**Step 1: Determine the Units to Be Assigned Costs** The first step is to determine the units to be assigned costs. A unit can be any measure of completed production, such as tons, gallons, pounds, barrels, or cases. For **S&W**, a unit is a gallon of ice cream.

S&W's Mixing Department had 65,000 gallons of direct materials to account for during July, as shown here.

Total gallons to account for:

Inventory in process, July 1	5,000 gallons
Received from materials storeroom	60,000
Total units to account for by the Packaging Department	<u>65,000</u> gallons

There are two groups of units to be assigned costs for the period.

```
Group 1 Units completed and transferred out
Group 2 Units in the July 31 (ending) work in process inventory
```

During July, the Mixing Department completed and transferred 62,000 gallons to the Packaging Department. Of the 60,000 gallons started in July, 57,000 (60,000 – 3,000) gallons were completed and transferred to the Packaging Department. Thus, the ending work in process inventory consists of 3,000 gallons.

The total units (gallons) to be assigned costs for S&W can be summarized as follows:

Group 1	Units transferred out to the Packaging Department in July	62,000 gallons
Group 2	Inventory in process, July 31	3,000
	Total gallons to be assigned costs	65,000 gallons 🗻

The total units (gallons) to be assigned costs (65,000 gallons) equal the total units to account for (65,000 gallons).

**Step 2: Compute Equivalent Units of Production S&W** has 3,000 gallons of whole units in the work in process inventory for the Mixing Department on July 31. Because these units are 25% complete, the number of equivalent units in process in the Mixing Department on July 31 is 750 gallons (3,000 gallons  $\times$  25%). Because the units transferred to the Packaging Department have been completed, the whole units (62,000 gallons) transferred are the same as the equivalent units transferred.

The total equivalent units of production for the Mixing Department are determined by adding the equivalent units in the ending work in process inventory to the units transferred and completed during the period, computed as follows:

**Step 3: Determine the Cost per Equivalent Unit** Because materials and conversion costs are combined under the average cost method, the cost per equivalent unit is determined by dividing the total production costs by the total equivalent units of production as follows:

```
\mbox{Cost per Equivalent Unit} = \frac{\mbox{Total Production Costs}}{\mbox{Total Equivalent Units}}
```

Cost per Equivalent Unit = 
$$\frac{\text{Total Production Costs}}{\text{Total Equivalent Units}} = \frac{\$89,105}{62,750 \text{ gallons}} = \$1.42$$

The cost per equivalent unit is used in Step 4 to allocate the production costs to the completed and partially completed units.

# **Step 4: Allocate Costs to Transferred Out and Partially Completed Units**

The cost of transferred and partially completed units is determined by multiplying the cost per equivalent unit times the equivalent units of production. For **S&W**'s Mixing Department, these costs are determined as follows:

Group 1	Transferred out to the Packaging Department (62,000 gallons $\times$ \$1.42)	\$88,040
Group 2	Inventory in process, July 31 (3,000 gallons $\times$ 25% $\times$ \$1.42)	1,065
	Total production costs assigned	\$89,105

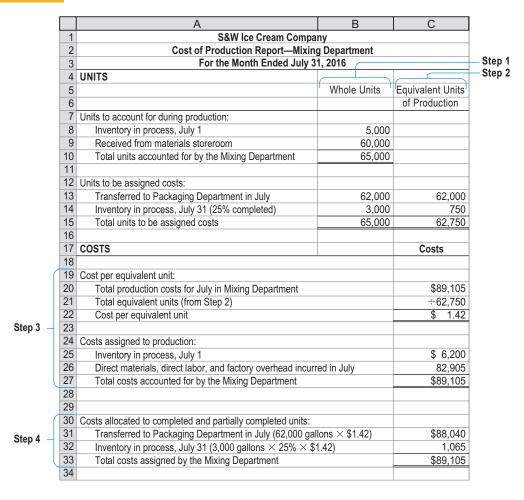
# **The Cost of Production Report**

The July cost of production report for **S&W**'s Mixing Department is shown in Exhibit 12. This cost of production report summarizes the following:

- The units for which the department is accountable and the disposition of those units
- The production costs incurred by the department and the allocation of those costs between completed and partially completed units

# **EXHIBIT 12**

# Cost of Production Report for S&W's Mixing Department—Average Cost



# At a Glance 18



# Describe process cost systems.

**Key Points** The process cost system is best suited for industries that mass produce identical units of a product. Costs are charged to processing departments, rather than to jobs as with the job order cost system. These costs are transferred from one department to the next until production is completed.

Learning Outcomes	Example Exercises	Practice Exercises
• Identify the characteristics of a process manufacturer.		
• Compare and contrast the job order cost system with the process cost system.	EE18-1	PE18-1A, 18-1B
<ul> <li>Describe the physical and cost flows of a process manufacturer.</li> </ul>		



# Prepare a cost of production report.

**Key Points** Manufacturing costs must be allocated between the units that have been completed and those that remain within the department. This allocation is accomplished by allocating costs using equivalent units of production.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Determine the whole units charged to production and to be assigned costs.</li> </ul>	EE18-2	PE18-2A, 18-2B
• Compute the equivalent units with respect to materials.	EE18-3	PE18-3A, 18-3B
• Compute the equivalent units with respect to conversion.	EE18-4	PE18-4A, 18-4B
• Compute the costs per equivalent unit.	EE18-5	PE18-5A, 18-5B
<ul> <li>Allocate the costs to beginning inventory, units started and completed, and ending inventory.</li> </ul>	EE18-6	PE18-6A, 18-6B
• Prepare a cost of production report.		



# Journalize entries for transactions using a process cost system.

**Key Points** Prepare the summary journal entries for materials, labor, applied factory overhead, and transferred costs incurred in production.

Learning Outcomes  • Prepare journal entries for process costing transactions.	Example Exercises EE18-7	Practice Exercises PE18-7A, 18-7B
• Summarize cost flows in T account form.		
Compute the ending inventory balances.		



# Describe and illustrate the use of cost of production reports for decision making.

**Key Points** The cost of production report provides information for controlling and improving operations. The report(s) can provide details of a department for a single period, or over a period of time. Yield measures the quantity of output of production relative to the inputs.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Prepare and evaluate a report showing the change in costs per unit by cost category for comparative periods.</li> </ul>	EE18-8	PE18-8A, 18-8B
Compute and interpret yield.		



## Compare lean manufacturing with traditional manufacturing processing.

**Key Points** The lean manufacturing philosophy focuses on reducing time, cost, and poor quality within the process.

## **Learning Outcome**

Identify the characteristics of lean manufacturing.

# **Key Terms**

cost of production report (839) cost per equivalent unit (844) equivalent units of production (841) first-in, first-out (FIFO) method (839)

lean manufacturing (854) manufacturing cells (855) process cost system (835) process manufacturer (834) whole units (841) yield (853)

# **Illustrative Problem**

Southern Aggregate Company manufactures concrete by a series of four processes. All materials are introduced in Crushing. From Crushing, the materials pass through Sifting, Baking, and Mixing, emerging as finished concrete. All inventories are costed by the first-in, first-out method.

The balances in the accounts Work in Process—Mixing and Finished Goods were as follows on May 1, 2016:

Inventory in Process—Mixing (2,000 units, 1/4 completed) \$13,700 Finished Goods (1,800 units at \$8.00 a unit) 14,400

The following costs were charged to Work in Process—Mixing during May:

Direct materials transferred from Baking: 15,200 units at

 \$6.50 a unit
 \$98,800

 Direct labor
 17,200

 Factory overhead
 11,780

During May, 16,000 units of concrete were completed, and 15,800 units were sold. Inventories on May 31 were as follows:

Inventory in Process—Mixing: 1,200 units, 1/2 completed Finished Goods: 2,000 units

# **Instructions**

- 1. Prepare a cost of production report for the Mixing Department.
- 2. Determine the cost of goods sold (indicate number of units and unit costs).
- 3. Determine the finished goods inventory, May 31, 2016.

## **Solution**

1.

	А	В	С	D	Е
1		rn Aggregate Com		•	
2	Cost of Product	ion Report—Mixin	g Department		
3	For the M	onth Ended May 3			
4			Equivale		
5	UNITS	Whole Units	Direct Materials	Conversion	
6	Units charged to production:				
7	Inventory in process, May 1	2,000			
8	Received from Baking	15,200			
9	Total units accounted for by the Mixing Department	17,200			
10					
11	Units to be assigned costs:				
12	Inventory in process, May 1 (25% completed)	2,000	0	1,500	
13	Started and completed in May	14,000	14,000	14,000	
14	Transferred to finished goods in May	16,000	14,000	15,500	
15	Inventory in process, May 31 (50% completed)	1,200	1,200	600	
16	Total units to be assigned costs	17,200	15,200	16,100	
17					
18				Costs	
19	COSTS		Direct Materials	Conversion	Total
20	Unit costs:				
21	Total costs for May in Mixing		\$ 98,800	\$ 28,980	
22	Total equivalent units (row 16)		÷15,200	÷16,100	
23	Cost per equivalent unit		\$ 6.50	\$ 1.80	
24					
25	Costs assigned to production:				
26	Inventory in process, May 1				\$ 13,700
27	Costs incurred in May				127,780
28	Total costs accounted for by the Mixing Department				\$141,480
29					
30	Cost allocated to completed and partially				
31	completed units:				
32	Inventory in process, May 1—balance				\$ 13,700
33	To complete inventory in process, May 1		\$ 0	\$ 2,700 ^a	2,700
34	Cost of completed May 1 work in process				\$ 16,400
35	Started and completed in May		91,000 ^b	25,200 ^c	116,200
36	Transferred to finished goods in May				\$132,600
37	Inventory in process, May 31		7,800 ^d	1,080 ^e	8,880
38	Total costs assigned by the Mixing Department				\$141,480
39					

 $^{^{}a}1,500 \times \$1.80 = \$2,700 \ ^{b}14,000 \times \$6.50 = \$91,000 \ ^{c}14,000 \times \$1.80 = \$25,200 \ ^{d}1,200 \times \$6.50 = \$7,800 \ ^{e}600 \times \$1.80 = \$1,080 \times \$1.80 \times \$1$ 

2. Cost of goods sold:

1,800 units at \$8.00 \$ 14,400 2,000 units at \$8.20* 16,400 12,000 units at \$8.30** 99,600 15,800 units \$130,400 (from finished goods beginning inventory) (from inventory in process beginning inventory) (from May production started and completed)

*(\$13,700 + \$2,700) ÷ 2,000 **\$116,200 ÷ 14,000

3. Finished goods inventory, May 31: 2,000 units at \$8.30 \$16,600

# **Discussion Questions**

- Which type of cost system, process or job order, would be best suited for each of the following:

   (a) TV assembler,
   (b) building contractor,
   (c) automobile repair shop,
   (d) paper manufacturer,
   (e) custom jewelry manufacturer? Give reasons for your answers.
- 2. In job order cost accounting, the three elements of manufacturing cost are charged directly to job orders. Why is it not necessary to charge manufacturing costs in process cost accounting to job orders?
- 3. In a job order cost system, direct labor and factory overhead applied are debited to individual jobs. How are these items treated in a process cost system and why?
- 4. Why is the cost per equivalent unit often determined separately for direct materials and conversion costs?

- 5. What is the purpose for determining the cost per equivalent unit?
- 6. Rameriz Company is a process manufacturer with two production departments, Blending and Filling. All direct materials are introduced in Blending from the materials store area. What is included in the cost transferred to Filling?
- 7. What is the most important purpose of the cost of production report?
- 8. How are cost of production reports used for controlling and improving operations?
- 9. How is "yield" determined for a process manufac-
- 10. How does lean manufacturing differ from the conventional manufacturing process?

# **Practice Exercises**

#### **EE 18-1** p. 837

## PE 18-1A Job order versus process costing

OBJ. 1



Which of the following industries would typically use job order costing, and which would typically use process costing?

Dentist Movie studio
Gasoline refining Paper manufacturing
Flour mill Custom printing

#### **EE 18-1** p. 837

#### PE 18-1B Job order versus process costing

OBJ. 1

Which of the following industries would typically use job order costing, and which would typically use process costing?

Steel manufactuirng Computer chip manufacturing
Business consulting Candy making

Web designer Designer clothes manufacturing

## **EE 18-2** p. 841

# PE 18-2A Units to be assigned costs

OBJ. 2



SHOW

ME HOW

Lilac Skin Care Company consists of two departments, Blending and Filling. The Filling Department received 45,000 ounces from the Blending Department. During the period, the Filling Department completed 42,800 ounces, including 4,000 ounces of work in process at the beginning of the period. The ending work in process inventory was 6,200 ounces. How many ounces were started and completed during the period?

#### **EE 18-2** p. 841

#### PE 18-2B Units to be assigned costs

OBJ. 2



Keystone Steel Company has two departments, Casting and Rolling. In the Rolling Department, ingots from the Casting Department are rolled into steel sheet. The Rolling Department received 8,500 tons from the Casting Department. During the period, the Rolling Department completed 7,900 tons, including 400 tons of work in process at the beginning of the period. The ending work in process inventory was 1,000 tons. How many tons were started and completed during the period?

### **EE 18-3** p. 843

### PE 18-3A Equivalent units of materials cost

OBJ. 2



The Filling Department of Lilac Skin Care Company had 4,000 ounces in beginning work in process inventory (70% complete). During the period, 42,800 ounces were completed. The ending work in process inventory was 6,200 ounces (40% complete). What are the total equivalent units for direct materials if materials are added at the beginning of the process?

#### **EE 18-3** p. 843

#### PE 18-3B Equivalent units of materials cost

OBJ. 2

The Rolling Department of Keystone Steel Company had 400 tons in beginning work in process inventory (20% complete). During the period, 7,900 tons were completed. The ending work in process inventory was 1,000 tons (30% complete). What are the total equivalent units for direct materials if materials are added at the beginning of the process?

# **EE 18-4** p. 844

#### PE 18-4A Equivalent units of conversion costs

OBJ. 2



MF HOW

The Filling Department of Lilac Skin Care had 4,000 ounces in beginning work in process inventory (70% complete). During the period, 42,800 ounces were completed. The ending work in process inventory was 6,200 ounces (40% complete). What are the total equivalent units for conversion costs?

#### EE 18-4 p. 844

## **PE 18-4B** Equivalent units of conversion costs

OBJ. 2



The Rolling Department of Keystone Steel Company had 400 tons in beginning work in process inventory (20% complete). During the period, 7,900 tons were completed. The ending work in process inventory was 1,000 tons (30% complete). What are the total equivalent units for conversion costs?

#### **EE 18-5** *p. 845*

### PE 18-5A Cost per equivalent unit

OBJ. 2



The cost of direct materials transferred into the Filling Department of Lilac Skin Care Company is \$20,250. The conversion cost for the period in the Filling Department is \$6,372. The total equivalent units for direct materials and conversion are 45,000 ounces and 42,480 ounces, respectively. Determine the direct materials and conversion costs per equivalent unit.

## **EE 18-5** *p. 845*

## PE 18-5B Cost per equivalent unit

OBJ. 2



The cost of direct materials transferred into the Rolling Department of Keystone Steel Company is \$510,000. The conversion cost for the period in the Rolling Department is \$81,200. The total equivalent units for direct materials and conversion are 8,500 tons and 8,120 tons, respectively. Determine the direct materials and conversion costs per equivalent unit.

# **EE 18-6** p. 847

## PE 18-6A Cost of units transferred out and ending work in process

OBJ. 2



The costs per equivalent unit of direct materials and conversion in the Filling Department of Lilac Skin Care Company are \$0.45 and \$0.15, respectively. The equivalent units to be assigned costs are as follows:

	Equivalent Units		
	<b>Direct Materials</b>	Conversion	
Inventory in process, beginning of period	0	1,200	
Started and completed during the period	38,800	38,800	
Transferred out of Filling (completed)	38,800	40,000	
Inventory in process, end of period	6,200	2,480	
Total units to be assigned costs	45,000	42,480	

The beginning work in process inventory had a cost of \$25,000. Determine the cost of completed and transferred-out production and the ending work in process inventory.

# **EE 18-6** p. 847

### PE 18-6B Cost of units transferred out and ending work in process

OBJ. 2

The costs per equivalent unit of direct materials and conversion in the Rolling Department of Keystone Steel Company are \$60 and \$10, respectively. The equivalent units to be assigned costs are as follows:

SHOW
ME HOW

#### **Equivalent Units Direct Materials** Conversion Inventory in process, beginning of period 0 320 Started and completed during the period 7,500 7,500 7,500 Transferred out of Rolling (completed) 7,820 Inventory in process, end of period 1,000 300 Total units to be assigned costs 8,500 8,120

The beginning work in process inventory had a cost of \$25,000. Determine the cost of completed and transferred-out production and the ending work in process inventory.

#### **EE 18-7** p. 851

#### PE 18-7A Process cost journal entries

OBJ. 3



The cost of materials transferred into the Filling Department of Lilac Skin Care Company is \$20,250, including \$6,000 from the Blending Department and \$14,250 from the materials storeroom. The conversion cost for the period in the Filling Department is \$6,372

(\$1,600 factory overhead applied and \$4,772 direct labor). The total cost transferred to Finished Goods for the period was \$25,660. The Filling Department had a beginning inventory of \$2,200.

- a. Journalize (1) the cost of transferred-in materials, (2) conversion costs, and (3) the costs transferred out to Finished Goods.
- b. Determine the balance of Work in Process—Filling at the end of the period.

#### **EE 18-7** *p. 851*

## PE 18-7B Process cost journal entries

OBJ. 3



The cost of materials transferred into the Rolling Department of Keystone Steel Company is \$510,000 from the Casting Department. The conversion cost for the period in the Rolling Department is \$81,200 (\$54,700 factory overhead applied and \$26,500 direct labor). The total cost transferred to Finished Goods for the period was \$553,200. The Rolling Department had a beginning inventory of \$25,000.

- a. Journalize (1) the cost of transferred-in materials, (2) conversion costs, and (3) the costs transferred out to Finished Goods.
- b. Determine the balance of Work in Process—Rolling at the end of the period.

#### **EE 18-8** p. 854

### PE 18-8A Using process costs for decision making

OBJ. 4



The costs of energy consumed in producing good units in the Baking Department of Pan Company were \$14,875 and \$14,615 for June and July, respectively. The number of equivalent units produced in June and July was 42,500 pounds and 39,500 pounds, respectively. Evaluate the change in the cost of energy between the two months.

#### **EE 18-8** p. 854

#### PE 18-8B Using process costs for decision making

**OBJ. 4** 



The costs of materials consumed in producing good units in the Forming Department of Thomas Company were \$76,000 and \$77,350 for September and October, respectively. The number of equivalent units produced in September and October was 800 tons and 850 tons, respectively. Evaluate the change in the cost of materials between the two months.

# Exercises



## EX 18-1 Entries for materials cost flows in a process cost system

OBJ. 1, 3

The Hershey Foods Company manufactures chocolate confectionery products. The three largest raw materials are cocoa, sugar, and dehydrated milk. These raw materials first go into the Blending Department. The blended product is then sent to the Molding Department, where the bars of candy are formed. The candy is then sent to the Packing Department, where the bars are wrapped and boxed. The boxed candy is then sent to the distribution center, where it is eventually sold to food brokers and retailers.

Show the accounts debited and credited for each of the following business events:

- a. Materials used by the Blending Department
- b. Transfer of blended product to the Molding Department
- c. Transfer of chocolate to the Packing Department
- d. Transfer of boxed chocolate to the distribution center
- e. Sale of boxed chocolate



## EX 18-2 Flowchart of accounts related to service and processing departments OBJ

Alcoa Inc. is the world's largest producer of aluminum products. One product that Alcoa manufactures is aluminum sheet products for the aerospace industry. The entire output of the Smelting Department is transferred to the Rolling Department. Part of the fully processed goods from the Rolling Department are sold as rolled sheet, and the remainder of the goods are transferred to the Converting Department for further processing into sheared sheet.

(Continued)

Prepare a chart of the flow of costs from the processing department accounts into the finished goods accounts and then into the cost of goods sold account. The relevant accounts are as follows:

Cost of Goods Sold	Finished Goods—Rolled Sheet
Materials	Finished Goods—Sheared Sheet
Factory Overhead—Smelting Department	Work in Process—Smelting Department
Factory Overhead—Rolling Department	Work in Process—Rolling Department
Factory Overhead—Converting Department	Work in Process—Converting Department

## EX 18-3 Entries for flow of factory costs for process cost system

**OBJ. 1, 3** 

OBJ, 1, 3

Domino Foods, Inc., manufactures a sugar product by a continuous process, involving three production departments—Refining, Sifting, and Packing. Assume that records indicate that direct materials, direct labor, and applied factory overhead for the first department, Refining, were \$372,000, \$143,000, and \$98,400, respectively. Also, work in process in the Refining Department at the beginning of the period totaled \$29,400, and work in process at the end of the period totaled \$28,700.

Journalize the entries to record (a) the flow of costs into the Refining Department during the period for (1) direct materials, (2) direct labor, and (3) factory overhead, and (b) the transfer of production costs to the second department, Sifting.

# EX 18-4 Factory overhead rate, entry for applying factory overhead, and factory overhead account balance

The chief cost accountant for Fizzy Fruit Beverage Co. estimated that total factory overhead cost for the Blending Department for the coming fiscal year beginning April 1 would be \$147,000, and total direct labor costs would be \$105,000. During April, the actual direct labor cost totaled \$12,000, and factory overhead cost incurred totaled \$17,050.

- a. What is the predetermined factory overhead rate based on direct labor cost?
- b. Journalize the entry to apply factory overhead to production for April.
- c. What is the April 30 balance of the account Factory Overhead—Blending Department?
- d. Does the balance in part (c) represent over- or underapplied factory overhead?

# EX 18-5 Equivalent units of production

OBJ. 2

The Converting Department of Soft Touch Towel and Tissue Company had 790 units in work in process at the beginning of the period, which were 60% complete. During the period, 13,700 units were completed and transferred to the Packing Department. There were 1,140 units in process at the end of the period, which were 25% complete. Direct materials are placed into the process at the beginning of production. Determine the number of equivalent units of production with respect to direct materials and conversion costs.

#### EX 18-6 Equivalent units of production

OBJ. 2

Units of production data for the two departments of Pacific Cable and Wire Company for November of the current fiscal year are as follows:

	<b>Drawing Department</b>	Winding Department
Work in process, November 1	5,000 units, 40% completed	3,200 units, 80% completed
Completed and transferred to next		
processing department during November	95,000 units	95,100 units
Work in process, November 30	6,200 units, 60% completed	3,100 units, 15% completed

If all direct materials are placed in process at the beginning of production, determine the direct materials and conversion equivalent units of production for November for (a) the Drawing Department and (b) the Winding Department.





✓ a. 140%



✓ Direct materials, 14,050 units



✓ a. Conversion, 96,720 units



#### EX 18-7 Equivalent units of production

OBJ. 2

The following information concerns production in the Baking Department for August. All direct materials are placed in process at the beginning of production.

#### **ACCOUNT Work in Process—Baking Department**

ACCOUNT NO.

					Bala	nce
Dat	e	Item	Debit	Credit	Debit	Credit
Aug.	1	Bal., 5,000 units, % completed			8,000	
	31	Direct materials, 204,000 units	306,000		314,000	
	31	Direct labor	35,500		349,500	
	31	Factory overhead	29,076		378,576	
	31	Goods finished, 196,000 units		356,580	21,996	
	31	Bal. ? units, % completed			21,996	
	31	bai. <u>r</u> uriits, % completed			∠1,996	

- a. Determine the number of units in work in process inventory at the end of the month.
- b. Determine the equivalent units of production for direct materials and conversion costs in August.

#### EX 18-8 Costs per equivalent unit

OBJ. 2, 4

- a. Based upon the data in Exercise 18-7, determine the following:
  - 1. Direct materials cost per equivalent unit.
  - 2. Conversion cost per equivalent unit.
  - 3. Cost of the beginning work in process completed during August.
  - 4. Cost of units started and completed during August.
  - 5. Cost of the ending work in process.
- b. Assuming that the direct materials cost is the same for July and August, did the conversion cost per equivalent unit increase, decrease, or remain the same in August?

#### EX 18-9 Equivalent units of production

OBJ. 2

Kellogg Company manufactures cold cereal products, such as *Frosted Flakes*. Assume that the inventory in process on March 1 for the Packing Department included 1,200 pounds of cereal in the packing machine hopper (enough for 800 24-oz. boxes), and 800 empty 24-oz. boxes held in the package carousel of the packing machine. During March, 65,400 boxes of 24-oz. cereal were packaged. Conversion costs are incurred when a box is filled with cereal. On March 31, the packing machine hopper held 900 pounds of cereal, and the package carousel held 600 empty 24-oz. (1½-pound) boxes. Assume that once a box is filled with cereal, it is immediately transferred to the finished goods warehouse.

Determine the equivalent units of production for cereal, boxes, and conversion costs for March. An equivalent unit is defined as "pounds" for cereal and "24-oz. boxes" for boxes and conversion costs.

#### EX 18-10 Costs per equivalent unit

OBJ. 2

Georgia Products Inc. completed and transferred 89,000 particle board units of production from the Pressing Department. There was no beginning inventory in process in the department. The ending in-process inventory was 2,400 units, which were ³/₅ complete as to conversion cost. All materials are added at the beginning of the process. Direct materials cost incurred was \$219,360, direct labor cost incurred was 28,100, and factory overhead applied was \$12,598.

Determine the following for the Pressing Department:

- a. Total conversion cost
- b. Conversion cost per equivalent unit
- c. Direct materials cost per equivalent unit

✓ a. 2. Conversion cost per equivalent unit, \$0.32

✓ b. Conversion, 201,800

MF HOW





**✓** c. \$2.40



#### ✓ a. 1,000 units





#### EX 18-11 Equivalent units of production and related costs

OBJ. 2

The charges to Work in Process—Assembly Department for a period, together with information concerning production, are as follows. All direct materials are placed in process at the beginning of production.

#### **Work in Process—Assembly Department**

Bal., 1,600 units, 35% completed	17,440	To Finished Goods, 29,600 units	?
Direct materials, 29,000 units @ \$9.50	275,500		
Direct labor	84,600		
Factory overhead	39,258		
Bal. ? units, 45% completed	?		

#### Determine the following:

- a. The number of units in work in process inventory at the end of the period
- b. Equivalent units of production for direct materials and conversion
- c. Costs per equivalent unit for direct materials and conversion
- d. Cost of the units started and completed during the period

#### EX 18-12 Cost of units completed and in process

OBJ. 2, 4

- a. Based on the data in Exercise 18-11, determine the following:
  - 1. Cost of beginning work in process inventory completed this period
  - 2. Cost of units transferred to finished goods during the period
  - 3. Cost of ending work in process inventory
  - 4. Cost per unit of the completed beginning work in process inventory, rounded to the nearest cent
- b. Did the production costs change from the preceding period? Explain.
- c. Assuming that the direct materials cost per unit did not change from the preceding period, did the conversion costs per equivalent unit increase, decrease, or remain the same for the current period?

#### EX 18-13 Errors in equivalent unit computation

OBJ. 2

Napco Refining Company processes gasoline. On June 1 of the current year, 6,400 units were ³/₅ completed in the Blending Department. During June, 55,000 units entered the Blending Department from the Refining Department. During June, the units in process at the beginning of the month were completed. Of the 55,000 units entering the department, all were completed except 5,200 units that were ¹/₅ completed. The equivalent units for conversion costs for June for the Blending Department were computed as follows:

#### Equivalent units of production in June:

To process units in inventory on June 1: 6,400 $\times$ $\frac{3}{5}$	3,840
To process units started and completed in June: 55,000 – 6,400	48,600
To process units in inventory on June 30: 5,200 $\times$ 1/5	1,040
Equivalent units of production	53,480

List the errors in the computation of equivalent units for conversion costs for the Blending Department for June.

#### EX 18-14 Cost per equivalent unit

OBJ. 2

The following information concerns production in the Forging Department for November. All direct materials are placed into the process at the beginning of production, and conversion costs are incurred evenly throughout the process. The beginning inventory consists of \$9,000 of direct materials.

✓ a. 1. \$21,808

✓ a. 12,400 units



#### ACCOUNT Work in Process—Forging Department

#### ACCOUNT NO.

					Bala	nce
Date		Item	Debit	Credit	Debit	Credit
Nov.	1	Bal., 900 units, 60% completed			10,566	
	30	Direct materials, 12,900 units	123,840		134,406	
	30	Direct labor	21,650		156,056	
	30	Factory overhead	16,870		172,926	
	30	Goods transferred, ? units		?	?	
	30	Bal., 1,400 units, 70% completed			?	

- a. Determine the number of units transferred to the next department.
- b. Determine the costs per equivalent unit of direct materials and conversion.
- c. Determine the cost of units started and completed in November.

#### EX 18-15 Costs per equivalent unit and production costs

**OBJ. 2, 4** 

Based on the data in Exercise 18-14, determine the following:

- a. Cost of beginning work in process inventory completed in November
- b. Cost of units transferred to the next department during November
- c. Cost of ending work in process inventory on November 30
- d. Costs per equivalent unit of direct materials and conversion included in the November 1 beginning work in process
- e. The November increase or decrease in costs per equivalent unit for direct materials and conversion from the previous month

#### EX 18-16 Cost of production report

OBJ. 2, 4

The debits to Work in Process—Roasting Department for Morning Brew Coffee Company for August 2016, together with information concerning production, are as follows:

Work in process, August 1, 700 pounds, 20% completed		\$ 3,479
*Direct materials (700 $\times$ \$4.70)	\$3,290	
Conversion (700 × 20% × \$1.35)	189	
	\$3,479	
Coffee beans added during August, 14,300 pounds		65,780
Conversion costs during August		21,942
Work in process, August 31, 400 pounds, 42% completed		?
Goods finished during August, 14,600 pounds		?

All direct materials are placed in process at the beginning of production.

- a. Prepare a cost of production report, presenting the following computations:
  - 1. Direct materials and conversion equivalent units of production for August
  - 2. Direct materials and conversion costs per equivalent unit for August
  - 3. Cost of goods finished during August
  - 4. Cost of work in process at August 31, 2016
- b. Compute and evaluate the change in cost per equivalent unit for direct materials and conversion from the previous month (July).

✓ a. \$11,646

✓ a. 4. \$2,092



#### EX 18-17 Cost of production report

**OBJ. 2, 4** 

✓ Conversion cost per equivalent unit, \$5.10

The Cutting Department of Karachi Carpet Company provides the following data for January 2016. Assume that all materials are added at the beginning of the process.

Work in process, January 1, 1,400 units, 75% completed		\$ 22,960*
*Direct materials (1,400 $\times$ \$12.65)	\$17,710	
Conversion (1,400 $\times$ 75% $\times$ \$5.00)	5,250	
	\$22,960	
Materials added during January from Weaving Department, 58,000 units		\$742,400
Direct labor for January		134,550
Factory overhead for January		151,611
Goods finished during January (includes goods in process, January 1), 56,200 units		_
Work in process, January 31, 3,200 units, 30% completed		_

- a. Prepare a cost of production report for the Cutting Department.
- b. Compute and evaluate the change in the costs per equivalent unit for direct materials and conversion from the previous month (December).

#### EX 18-18 Cost of production and journal entries

OBJ. 1, 2, 3, 4

AccuBlade Castings Inc. casts blades for turbine engines. Within the Casting Department, alloy is first melted in a crucible, then poured into molds to produce the castings. On May 1, there were 230 pounds of alloy in process, which were 60% complete as to conversion. The Work in Process balance for these 230 pounds was \$32,844, determined as follows:

Direct materials (230 $\times$ \$132)	\$30,360
Conversion (230 $\times$ 60% $\times$ \$18)	2,484
	\$32,844

During May, the Casting Department was charged \$350,000 for 2,500 pounds of alloy and \$19,840 for direct labor. Factory overhead is applied to the department at a rate of 150% of direct labor. The department transferred out 2,530 pounds of finished castings to the Machining Department. The May 31 inventory in process was 44% complete as to conversion.

- a. Prepare the following May journal entries for the Casting Department:
  - 1. The materials charged to production
  - 2. The conversion costs charged to production
  - 3. The completed production transferred to the Machining Department
- b. Determine the Work in Process—Casting Department May 31 balance.
- c. Compute and evaluate the change in the costs per equivalent unit for direct materials and conversion from the previous month (April).

#### EX 18-19 Cost of production and journal entries

OBJ. 1, 2, 3

Lighthouse Paper Company manufactures newsprint. The product is manufactured in two departments, Papermaking and Converting. Pulp is first placed into a vessel at the beginning of papermaking production. The following information concerns production in the Papermaking Department for March:

#### ACCOUNT Work in Process—Papermaking Department

ACCOUNT NO.

					Bala	nce
Dat	e	Item	Debit	Credit	Debit	Credit
Mar.	1	Bal., 2,600 units, 35% completed			9,139	
	31	Direct materials, 105,000 units	330,750		339,889	
	31	Direct labor	40,560		380,449	
	31	Factory overhead	54,795		435,244	
	31	Goods transferred, 103,900 units		?	?	
	31	Bal., 3,700 units, 80% completed			?	

**✓** b. \$29,760

**✓** b. \$14,319

- a. Prepare the following March journal entries for the Papermaking Department:
  - 1. The materials charged to production.
  - 2. The conversion costs charged to production.
  - 3. The completed production transferred to the Converting Department.
- b. Determine the Work in Process—Papermaking Department March 31 balance.

# Ā

#### EX 18-20 Process costing for a service company

OBJ. 4

Madison Electric Company uses a fossil fuel (coal) plant for generating electricity. The facility can generate 900 megawatts (million watts) per hour. The plant operates 600 hours during March. Electricity is used as it is generated; thus, there are no inventories at the beginning or end of the period. The March conversion and fuel costs are as follows:

Conversion costs	\$40,500,000
Fuel	10,800,000
Total	\$51,300,000

Madison also has a wind farm that can generate 100 megawatts per hour. The wind farm receives sufficient wind to run 300 hours for March. The March conversion costs for the wind farm (mostly depreciation) are as follows:

Conversion costs \$2,700,000

- a. Determine the cost per megawatt hour (MWh) for the fossil fuel plant and the wind farm to identify the lowest cost facility in March.
- b. Why are equivalent units of production not needed in determining the cost per megawatt hour (MWh) for generating electricity?
- c. What advantage does the fossil fuel plant have over the wind farm?



#### EX 18-21 Decision making

OBJ. 4

Mystic Bottling Company bottles popular beverages in the Bottling Department. The beverages are produced by blending concentrate with water and sugar. The concentrate is purchased from a concentrate producer. The concentrate producer sets higher prices for the more popular concentrate flavors. A simplified Bottling Department cost of production report separating the cost of bottling the four flavors follows:

	A	В	С	D	Е
1		Orange	Cola	Lemon-Lime	Root Beer
2	Concentrate	\$ 4,625	\$129,000	\$ 105,000	\$ 7,600
3	Water	1,250	30,000	25,000	2,000
4	Sugar	3,000	72,000	60,000	4,800
5	Bottles	5,500	132,000	110,000	8,800
6	Flavor changeover	3,000	4,800	4,000	10,000
7	Conversion cost	1,750	24,000	20,000	2,800
8	Total cost transferred to finished goods	\$19,125	\$391,800	\$324,000	\$36,000
9	Number of cases	2,500	60,000	50,000	4,000
10					

Beginning and ending work in process inventories are negligible, so they are omitted from the cost of production report. The flavor changeover cost represents the cost of cleaning the bottling machines between production runs of different flavors.

Prepare a memo to the production manager, analyzing this comparative cost information. In your memo, provide recommendations for further action, along with supporting schedules showing the total cost per case and cost per case by cost element.

#### EX 18-22 Decision making

**OBJ. 4** 

Pix Paper Inc. produces photographic paper for printing digital images. One of the processes for this operation is a coating (solvent spreading) operation, where chemicals are coated onto paper stock. There has been some concern about the cost performance of this operation. As a result, you have begun an investigation. You first discover that all materials and conversion prices have been stable for the last six months. Thus, increases in prices for inputs are not an explanation for increasing costs. However, you have discovered three possible problems from some of the operating personnel whose quotes follow:

Operator 1: "I've been keeping an eye on my operating room instruments. I feel as though our energy consumption is becoming less efficient."

Operator 2: "Every time the coating machine goes down, we produce waste on shutdown and subsequent startup. It seems like during the last half year we have had more unscheduled machine shutdowns than in the past. Thus, I feel as though our yields must be dropping."

Operator 3: "My sense is that our coating costs are going up. It seems to me like we are spreading a thicker coating than we should. Perhaps the coating machine needs to be recalibrated."

The Coating Department had no beginning or ending inventories for any month during the study period. The following data from the cost of production report are made available:

	A	В	С	D	Е	F	G
1		January	February	March	April	May	June
2	Paper stock	\$67,200	\$63,840	\$60,480	\$64,512	\$57,120	\$53,760
3	Coating	\$11,520	\$11,856	\$12,960	\$15,667	\$16,320	\$18,432
4	Conversion cost (incl. energy)	\$38,400	\$36,480	\$34,560	\$36,864	\$32,640	\$30,720
5	Pounds input to the process	100,000	95,000	90,000	96,000	85,000	80,000
6	Pounds transferred out	96,000	91,200	86,400	92,160	81,600	76,800
7							

- a. Prepare a table showing the paper cost per output pound, coating cost per output pound, conversion cost per output pound, and yield (pounds transferred out/pounds input) for each month.
- b. Interpret your table results.

#### EX 18-23 Lean manufacturing

OBJ. 5

The following are some quotes provided by a number of managers at Hawkeye Machining Company regarding the company's planned move toward a lean manufacturing system:

Director of Sales: I'm afraid we'll miss some sales if we don't keep a large stock of items on hand just in case demand increases. It only makes sense to me to keep large inventories in order to assure product availability for our customers.

Director of Purchasing: I'm very concerned about moving to a lean system for materials. What would happen if one of our suppliers were unable to make a shipment? A supplier could fall behind in production or have a quality problem. Without some safety stock in our materials, our whole plant would shut down.

Director of Manufacturing: If we go to lean manufacturing, I think our factory output will drop. We need in-process inventory in order to "smooth out" the inevitable problems that occur during manufacturing. For example, if a machine that is used to process a product breaks down, it would starve the next machine if I don't have in-process inventory between the two machines. If I have in-process inventory, then I can keep the next operation busy while I fix the broken machine. Thus, the in-process inventories give me a safety valve that I can use to keep things running when things go wrong.

How would you respond to these managers?

#### Appendix

#### EX 18-24 Equivalent units of production: average cost method

The Converting Department of Tender Soft Tissue Company uses the average cost method and had 1,900 units in work in process that were 60% complete at the beginning of the period. During the period, 15,800 units were completed and transferred to the Packing Department. There were 1,200 units in process that were 30% complete at the end of the period.

- a. Determine the number of whole units to be accounted for and to be assigned costs for the period.
- b. Determine the number of equivalent units of production for the period.

**✓** a. 17,000

#### **Appendix**

#### EX 18-25 Equivalent units of production: average cost method

✓ a. 12,100 units to be accounted for

Units of production data for the two departments of Atlantic Cable and Wire Company for July of the current fiscal year are as follows:

	<b>Drawing Department</b>	Winding Department
Work in process, July 1	500 units, 50% completed	350 units, 30% completed
Completed and transferred to next		
processing department during July	11,400 units	10,950 units
Work in process, July 31	700 units, 55% completed	800 units, 25% completed

Each department uses the average cost method.

- a. Determine the number of whole units to be accounted for and to be assigned costs and the equivalent units of production for the Drawing Department.
- b. Determine the number of whole units to be accounted for and to be assigned costs and the equivalent units of production for the Winding Department.

#### **Appendix**

#### EX 18-26 Equivalent units of production: average cost method

The following information concerns production in the Finishing Department for May. The Finishing Department uses the average cost method.

#### **ACCOUNT Work in Process—Finishing Department**

#### ACCOUNT NO.

					Bala	ince
Dat	e	Item	Debit	Credit	Debit	Credit
May	1 31 31 31 31 31	Bal., 4,200 units, 70% completed Direct materials, 23,600 units Direct labor Factory overhead Goods transferred, 24,700 units Bal., 2 units, 30% completed	125,800 75,400 82,675	308,750	36,500 162,300 237,700 320,375 11,625 11,625	

- a. Determine the number of units in work in process inventory at the end of the month.
- b. Determine the number of whole units to be accounted for and to be assigned costs and the equivalent units of production for May.

#### **Appendix**

#### EX 18-27 Equivalent units of production and related costs

The charges to Work in Process—Baking Department for a period as well as information concerning production are as follows. The Baking Department uses the average cost method, and all direct materials are placed in process during production.

Wo	Work in Process—Baking Department				
Bal., 900 units, 40% completed	2,466	To Finished Goods, 8,100 units	?		
Direct materials, 8,400 units	34,500				
Direct labor	16,200				
Factory overhead	8,574				
Bal., 1,200 units, 60% completed	?				

#### Determine the following:

- a. The number of whole units to be accounted for and to be assigned costs
- b. The number of equivalent units of production
- c. The cost per equivalent unit
- d. The cost of units transferred to Finished Goods
- e. The cost of units in ending Work in Process

✓ a. 3,100

✓ b. 8,820 units



#### **Appendix**

#### EX 18-28 Cost per equivalent unit: average cost method

✓ a. \$26.00

The following information concerns production in the Forging Department for June. The Forging Department uses the average cost method.

#### ACCOUNT Work in Process—Forging Department

ACCOUNT NO.

				Bala	nce
Date	Item	Debit	Credit	Debit	Credit
June 1 30 30 30 30 30 30	Direct labor Factory overhead Goods transferred, 3,600 units	49,200 25,200 25,120	?	5,000 54,200 79,400 104,520 ?	

- a. Determine the cost per equivalent unit.
- b. Determine cost of units transferred to Finished Goods.
- c. Determine the cost of units in ending Work in Process.

#### **Appendix**

#### EX 18-29 Cost of production report: average cost method

✓ Cost per equivalent unit, \$3.60

The increases to Work in Process—Roasting Department for Highlands Coffee Company for May 2016 as well as information concerning production are as follows:

Work in process, May 1, 1,150 pounds, 40% completed	\$ 1,700
Coffee beans added during May, 10,900 pounds	28,600
Conversion costs during May	12,504
Work in process, May 31, 800 pounds, 80% completed	_
Goods finished during May, 11,250 pounds	_

Prepare a cost of production report, using the average cost method.

#### **Appendix**

#### **EX 18-30** Cost of production report: average cost method

✓ Cost per equivalent unit, \$9.00

Prepare a cost of production report for the Cutting Department of Dalton Carpet Company for January 2016. Use the average cost method with the following data:



Work in process, January 1, 3,400 units, 75% completed	\$ 23,000	
Materials added during January from Weaving Department, 64,000 units	366,200	
Direct labor for January	105,100	
Factory overhead for January	80,710	
Goods finished during January (includes goods in process, January 1), 63,500 units	_	
Work in process, January 31, 3,900 units, 10% completed	_	

# **Problems: Series A**

#### PR 18-1A Entries for process cost system

OBJ. 1, 3

✓ 2. Materials October 31 balance, \$5,900

General Ledger



FloorMate Carpet Company manufactures carpets. Fiber is placed in process in the Spinning Department, where it is spun into yarn. The output of the Spinning Department is transferred to the Tufting Department, where carpet backing is added at the beginning of the process and the process is completed. On October 1, FloorMate Carpet Company had the following inventories:

Finished Goods	\$5,600
Work in Process—Spinning Department	1,500
Work in Process—Tufting Department	2,300
Materials	4.800

Departmental accounts are maintained for factory overhead, and both have zero balances on October 1.

Manufacturing operations for October are summarized as follows:

a. Materials purchased on account	\$ 84,900
b. Materials requisitioned for use:	
Fiber—Spinning Department	\$ 43,600
Carpet backing—Tufting Department	34,100
Indirect materials—Spinning Department	3,200
Indirect materials—Tufting Department	2,900
c. Labor used:	
Direct labor—Spinning Department	\$ 26,300
Direct labor—Tufting Department	17,900
Indirect labor—Spinning Department	12,100
Indirect labor—Tufting Department	11,700
d. Depreciation charged on fixed assets:	
Spinning Department	\$ 5,300
Tufting Department	3,400
e. Expired prepaid factory insurance:	
Spinning Department	\$ 1,200
Tufting Department	1,000
f. Applied factory overhead:	
Spinning Department	\$ 22,000
Tufting Department	18,700
g. Production costs transferred from Spinning Department to Tufting Department	\$ 88,000
h. Production costs transferred from Tufting Department to Finished Goods	\$159,000
i. Cost of goods sold during the period	\$160,500

#### **Instructions**

- 1. Journalize the entries to record the operations, identifying each entry by letter.
- 2. Compute the October 31 balances of the inventory accounts.
- 3. Compute the October 31 balances of the factory overhead accounts.

#### PR 18-2A Cost of production report

OBJ. 2, 4

Fresh Mountain Coffee Company roasts and packs coffee beans. The process begins by placing coffee beans into the Roasting Department. From the Roasting Department, coffee beans are then transferred to the Packing Department. The following is a partial work in process account of the Roasting Department at March 31, 2016:

#### ACCOUNT Work in Process—Roasting Department

ACCOUNT NO.

					Balance	
Dat	e	Item	Debit	Credit	Debit	Credit
Mar.	1	Bal., 1,500 units, 30% completed			6,150	
	31	Direct materials, 22,300 units	86,970		93,120	
	31	Direct labor	11,900		105,020	
	31	Factory overhead	5,772		110,792	
	31	Goods transferred, 21,700 units		?		
	31	Bal., ? units, 40% completed			?	

#### Instructions

- 1. Prepare a cost of production report, and identify the missing amounts for Work in Process—Roasting Department.
- 2. Assuming that the March 1 work in process inventory includes \$5,700 of direct materials, determine the increase or decrease in the cost per equivalent unit for direct materials and conversion between February and March.

✓ 1. Conversion cost per equivalent unit, \$0.80



# PR 18-3A Equivalent units and related costs; cost of production report; entries

OBJ. 2, 3, 4

✓ 2. Transferred to Packaging Dept., \$40,183



White Diamond Flour Company manufactures flour by a series of three processes, beginning with wheat grain being introduced in the Milling Department. From the Milling Department, the materials pass through the Sifting and Packaging departments, emerging as packaged refined flour.

The balance in the account Work in Process—Sifting Department was as follows on July 1, 2016:

Work in Process—Sifting Department (900 units, 3/2 completed):

Direct materials  $(900 \times \$2.05)$  \$1,845 Conversion  $(900 \times \frac{1}{2} \times \$0.40)$  216 \$2,061

The following costs were charged to Work in Process—Sifting Department during July:

Direct materials transferred from Milling Department:

15,700 units at \$2.15 a unit	\$33,755
Direct labor	4,420
Factory overhead	2,708

During July, 15,500 units of flour were completed. Work in Process—Sifting Department on July 31 was 1,100 units, ½ completed.

#### **Instructions**

- 1. Prepare a cost of production report for the Sifting Department for July.
- 2. Journalize the entries for costs transferred from Milling to Sifting and the costs transferred from Sifting to Packaging.
- Determine the increase or decrease in the cost per equivalent unit from June to July for direct materials and conversion costs.
- 4. Discuss the uses of the cost of production report and the results of part (3).

# PR 18-4A Work in process account data for two months; cost of production OBJ. 1, 2, 3, 4 reports

Hearty Soup Co. uses a process cost system to record the costs of processing soup, which requires the cooking and filling processes. Materials are entered from the cooking process at the beginning of the filling process. The inventory of Work in Process—Filling on April 1 and debits to the account during April 2016 were as follows:

Bal., 800 units, 30% completed:

Direct materials (800 $\times$ \$4.30)	\$ 3,440
Conversion (800 $\times$ 30% $\times$ \$1.75)	420
	\$ 3,860
From Cooking Department, 7,800 units	\$34,320
Direct labor	8,562
Factory overhead	6,387

During April, 800 units in process on April 1 were completed, and of the 7,800 units entering the department, all were completed except 550 units that were 90% completed. Charges to Work in Process—Filling for May were as follows:

From Cooking Department, 9,600 units	\$44,160
Direct labor	12,042
Factory overhead	6,878

During May, the units in process at the beginning of the month were completed, and of the 9,600 units entering the department, all were completed except 300 units that were 35% completed.

#### Instructions

1. Enter the balance as of April 1, 2016, in a four-column account for Work in Process—Filling. Record the debits and the credits in the account for April. Construct a cost of production report, and present computations for determining (a) equivalent units of production for materials and conversion, (b) costs per equivalent unit, (c) cost of goods

✓ 1. c. Transferred to finished goods in April, \$49,818



- finished, differentiating between units started in the prior period and units started and finished in April, and (d) work in process inventory.
- 2. Provide the same information for May by recording the May transactions in the four-column work in process account. Construct a cost of production report, and present the May computations (a through d) listed in part (1).
- 3. Comment on the change in costs per equivalent unit for March through May for direct materials and conversion costs.

#### **Appendix**

#### PR 18-5A Cost of production report: average cost method

✓ Cost per equivalent unit, \$2.70



Sunrise Coffee Company roasts and packs coffee beans. The process begins in the Roasting Department. From the Roasting Department, the coffee beans are transferred to the Packing Department. The following is a partial work in process account of the Roasting Department at December 31, 2016:

#### ACCOUNT Work in Process—Roasting Department

#### ACCOUNT NO.

					Balance	
Date		Item	Debit	Credit	Debit	Credit
3	1 31 31 31 31	Bal., 10,500 units, 75% completed Direct materials, 210,400 units Direct labor Factory overhead Goods transferred, 208,900 units Bal., 2 units, 25% completed	246,800 135,700 168,630	?	21,000 267,800 403,500 572,130 ?	

#### **Instructions**

Prepare a cost of production report, using the average cost method, and identify the missing amounts for Work in Process—Roasting Department.

# **Problems: Series B**

#### PR 18-1B Entries for process cost system

OBJ. 1, 3

✓ 2. MaterialsJuly 31 balance, \$11,390





Preston & Grover Soap Company manufactures powdered detergent. Phosphate is placed in process in the Making Department, where it is turned into granulars. The output of Making is transferred to the Packing Department, where packaging is added at the beginning of the process. On July 1, Preston & Grover Soap Company had the following inventories:

Finished Goods	\$13,500
Work in Process—Making	6,790
Work in Process—Packing	7,350
Materials	5,100

Departmental accounts are maintained for factory overhead, which both have zero balances on July 1.

Manufacturing operations for July are summarized as follows:

a. Materials purchased on account	\$149,800
b. Materials requisitioned for use:	
Phosphate—Making Department	\$105,700
Packaging—Packing Department	31,300
Indirect materials—Making Department	4,980
Indirect materials—Packing Department.	1,530

(Continued)

c. Labor used:	
Direct labor—Making Department	\$ 32,400
Direct labor—Packing Department	40,900
Indirect labor—Making Department	15,400
Indirect labor—Packing Department	18,300
d. Depreciation charged on fixed assets:	
Making Department	\$ 10,700
Packing Department	7,900
e. Expired prepaid factory insurance:	
Making Department	\$ 2,000
Packing Department	1,500
f. Applied factory overhead:	
Making Department	\$ 32,570
Packing Department	30,050
g. Production costs transferred from Making Department to Packing Department	\$166,790
h. Production costs transferred from Packing Department to Finished Goods	\$263,400
i. Cost of goods sold during the period	\$265,200

#### Instructions

- 1. Journalize the entries to record the operations, identifying each entry by letter.
- 2. Compute the July 31 balances of the inventory accounts.
- 3. Compute the July 31 balances of the factory overhead accounts.

#### PR 18-2B Cost of production report

OBJ. 2, 4

Bavarian Chocolate Company processes chocolate into candy bars. The process begins by placing direct materials (raw chocolate, milk, and sugar) into the Blending Department. All materials are placed into production at the beginning of the blending process. After blending, the milk chocolate is then transferred to the Molding Department, where the milk chocolate is formed into candy bars. The following is a partial work in process account of the Blending Department at October 31, 2016:

#### ACCOUNT Work in Process—Blending Department

ACCOUNT NO.

					Bala	nce
Date		Item	Debit	Credit	Debit	Credit
Oct.	1 31 31 31	Bal., 2,300 units, 3/s completed Direct materials, 26,000 units Direct labor Factory overhead	429,000 100,560 48,480	?	46,368 475,368 575,928 624,408	
	31 31	Goods transferred, 25,700 units Bal., <u>?</u> units, ½ completed		?	?	

#### Instructions

- 1. Prepare a cost of production report, and identify the missing amounts for Work in Process—Blending Department.
- 2. Assuming that the October 1 work in process inventory includes direct materials of \$38,295, determine the increase or decrease in the cost per equivalent unit for direct materials and conversion between September and October.

✓ 1. Conversion cost per equivalent unit, \$6.00



# PR 18-3B Equivalent units and related costs; cost of production report; entries

OBJ. 2, 3, 4

✓ 2. Transferred to finished goods, \$705,376



Dover Chemical Company manufactures specialty chemicals by a series of three processes, all materials being introduced in the Distilling Department. From the Distilling Department, the materials pass through the Reaction and Filling departments, emerging as finished chemicals.

The balance in the account Work in Process—Filling was as follows on January 1, 2016:

Work in Process—Filling Department

(3,400 units, 60% completed):

Direct materials (3,400 $\times$ \$9.58)	\$32,572
Conversion $(3,400 \times 60\% \times \$3.90)$	7,956
	\$40,528

The following costs were charged to Work in Process—Filling during January:

Direct materials transferred from Reaction

Department: 52,300 units at \$9.50 a unit	\$496,850
Direct labor	101,560
Factory overhead	95,166

During January, 53,000 units of specialty chemicals were completed. Work in Process—Filling Department on January 31 was 2,700 units, 30% completed.

#### **Instructions**

- 1. Prepare a cost of production report for the Filling Department for January.
- 2. Journalize the entries for costs transferred from Reaction to Filling and the costs transferred from Filling to Finished Goods.
- 3. Determine the increase or decrease in the cost per equivalent unit from December to January for direct materials and conversion costs.
- 4. Discuss the uses of the cost of production report and the results of part (3).

# PR 18-4B Work in process account data for two months; cost of production OBJ. 1, 2, 3, 4 reports

Pittsburgh Aluminum Company uses a process cost system to record the costs of manufacturing rolled aluminum, which consists of the smelting and rolling processes. Materials are entered from smelting at the beginning of the rolling process. The inventory of Work in Process—Rolling on September 1, 2016, and debits to the account during September were as follows:

Bal., 2,600 units, ¼ completed:

Direct materials (2,600 $\times$ \$15.50)	\$40,300
Conversion (2,600 $\times$ $\frac{1}{4}$ $\times$ \$8.50)	5,525
	\$45,825
From Smelting Department, 28,900 units	462,400
Direct labor	158,920
Factory overhead	101,402

During September, 2,600 units in process on September 1 were completed, and of the 28,900 units entering the department, all were completed except 2,900 units that were ½ completed.

Charges to Work in Process—Rolling for October were as follows:

From Smelting Department, 31,000 units	\$511,500
Direct labor	162,850
Factory overhead	104.494

During October, the units in process at the beginning of the month were completed, and of the 31,000 units entering the department, all were completed except 2,000 units that were ½ completed.

(Continued)

✓ 1. c. Transferred to finished goods in September, \$702,195



#### **Instructions**

- 1. Enter the balance as of September 1, 2016, in a four-column account for Work in Process—Rolling. Record the debits and the credits in the account for September. Construct a cost of production report and present computations for determining (a) equivalent units of production for materials and conversion, (b) costs per equivalent unit, (c) cost of goods finished, differentiating between units started in the prior period and units started and finished in September, and (d) work in process inventory.
- 2. Provide the same information for October by recording the October transactions in the four-column work in process account. Construct a cost of production report, and present the October computations (a through d) listed in part (1).
- 3. Comment on the change in costs per equivalent unit for August through October for direct materials and conversion cost.

# Appendix

#### PR 18-5B Cost of production report: average cost method

Blue Ribbon Flour Company manufactures flour by a series of three processes, beginning in the Milling Department. From the Milling Department, the materials pass through the Sifting and Packaging departments, emerging as packaged refined flour.

The balance in the account Work in Process—Sifting Department was as follows on May 1, 2016:

Work in Process—Sifting Department (1,500 units, 75% completed) \$3,40

The following costs were charged to Work in Process—Sifting Department during May:

Direct materials transferred from Milling Department: 18,300 units	\$32,600
Direct labor	14,560
Factory overhead	7,490

During May, 18,000 units of flour were completed and transferred to finished goods. Work in Process—Sifting Department on May 31 was 1,800 units, 75% completed.

#### Instructions

Prepare a cost of production report for the Sifting Department for May, using the average cost method.

# **Cases & Projects**

#### CP 18-1 Ethics and professional conduct in business

Assume you are the division controller for Auntie M's Cookie Company. Auntie M has introduced a new chocolate chip cookie called Full of Chips, and it is a success. As a result, the product manager responsible for the launch of this new cookie was promoted to division vice president and became your boss. A new product manager, Bishop, has been brought in to replace the promoted manager. Bishop notices that the Full of Chips cookie uses a lot of chips, which increases the cost of the cookie. As a result, Bishop has ordered that the amount of chips used in the cookies be reduced by 10%. The manager believes that a 10% reduction in chips will not adversely affect sales but will reduce costs and, hence, improve margins. The increased margins would help Bishop meet profit targets for the period.

You are looking over some cost of production reports segmented by cookie line. You notice that there is a drop in the materials costs for Full of Chips. On further investigation, you discover why the chip costs have declined (fewer chips). Both you and Bishop report to the division vice president, who was the original product manager for Full of Chips. You are trying to decide what to do, if anything.

Discuss the options you might consider.

#### ٠.

# \$54,000

✓ Transferred to Packaging Dept.,



#### **CP 18-2** Accounting for materials costs

In papermaking operations for companies such as International Paper Company, wet pulp is fed into paper machines, which press and dry pulp into a continuous sheet of paper. The paper is formed at very high speeds (60 mph). Once the paper is formed, the paper is rolled onto a reel at the back end of the paper machine. One of the characteristics of papermaking is the creation of "broke" paper. Broke is paper that fails to satisfy quality standards and is therefore rejected for final shipment to customers. Broke is recycled back to the beginning of the process by combining the recycled paper with virgin (new) pulp material. The combination of virgin pulp and recycled broke is sent to the paper machine for papermaking. Broke is fed into this recycle process continuously from all over the facility.

In this industry, it is typical to charge the papermaking operation with the cost of direct materials, which is a mixture of virgin materials and broke. Broke has a much lower cost than does virgin pulp. Therefore, the more broke in the mixture, the lower the average cost of direct materials to the department. Papermaking managers will frequently comment on the importance of broke for keeping their direct materials costs down.

- a. How do you react to this accounting procedure?
- b. What "hidden costs" are not considered when accounting for broke as described?

#### CP 18-3 Analyzing unit costs

Midstate Containers Inc. manufactures cans for the canned food industry. The operations manager of a can manufacturing operation wants to conduct a cost study investigating the relationship of tin content in the material (can stock) to the energy cost for enameling the cans. The enameling was necessary to prepare the cans for labeling. A higher percentage of tin content in the can stock increases the cost of material. The operations manager believed that a higher tin content in the can stock would reduce the amount of energy used in enameling. During the analysis period, the amount of tin content in the steel can stock was increased for every month, from April to September. The following operating reports were available from the controller:

	Α	В	С	D	Е	F	G
1		April	May	June	July	August	September
2	Energy	\$ 14,000	\$ 34,800	\$ 33,000	\$ 21,700	\$ 28,800	\$ 33,000
3	Materials	13,000	28,800	24,200	14,000	17,100	16,000
4	Total cost	\$ 27,000	\$ 63,600	\$ 57,200	\$ 35,700	\$ 45,900	\$ 49,000
5	Units produced	÷50,000	÷120,000	÷110,000	÷ 70,000	÷ 90,000	÷100,000
6	Cost per unit	\$ 0.54	\$ 0.53	\$ 0.52	\$ 0.51	\$ 0.51	\$ 0.49
7							

Differences in materials unit costs were entirely related to the amount of tin content.

Interpret this information and report to the operations manager your recommendations with respect to tin content.

#### **CP 18-4** Decision making

Jamarcus Bradshaw, plant manager of Georgia Paper Company's papermaking mill, was looking over the cost of production reports for July and August for the Papermaking Department. The reports revealed the following:

	July	August
Pulp and chemicals	\$295,600	\$304,100
Conversion cost	146,000	149,600
Total cost	\$441,600	\$453,700
Number of tons	÷ 1,200	÷ 1,130
Cost per ton	\$ 368	\$ 401.50

(Continued)

Jamarcus was concerned about the increased cost per ton from the output of the department. As a result, he asked the plant controller to perform a study to help explain these results. The controller, Leann Brunswick, began the analysis by performing some interviews of key plant personnel in order to understand what the problem might be. Excerpts from an interview with Len Tyson, a paper machine operator, follow:

Len: We have two papermaking machines in the department. I have no data, but I think paper machine No. 1 is applying too much pulp and, thus, is wasting both conversion and materials resources. We haven't had repairs on paper machine No. 1 in a while. Maybe this is the problem.

Leann: How does too much pulp result in wasted resources?

Len: Well, you see, if too much pulp is applied, then we will waste pulp material. The customer will not pay for the extra weight. Thus, we just lose that amount of material. Also, when there is too much pulp, the machine must be slowed down in order to complete the drying process. This results in a waste of conversion costs.

Leann: Do you have any other suspicions?

Len: Well, as you know, we have two products—green paper and yellow paper. They are identical except for the color. The color is added to the papermaking process in the paper machine. I think that during August these two color papers have been behaving very differently. I don't have any data, but it just seems as though the amount of waste associated with the green paper has increased.

Leann: Why is this?

Len: I understand that there has been a change in specifications for the green paper, starting near the beginning of August. This change could be causing the machines to run poorly when making green paper. If this is the case, the cost per ton would increase for green paper.

Leann also asked for a database printout providing greater detail on August's operating results.

September 9 Papermaking Department—August detail

Requested	bv:	Leann	Brunswick
requestea	$\sim$ $_{j}$ .	LCuilli	DIGITOWICH

	Α	В	С	D	Е	F
1	Production					
2	Run	Paper		Material	Conversion	
3	Number	Machine	Color	Costs	Costs	Tons
4	1	1	Green	40,300	18,300	150
5	2	1	Yellow	41,700	21,200	140
6	3	1	Green	44,600	22,500	150
7	4	1	Yellow	36,100	18,100	120
8	5	2	Green	38,300	18,900	160
9	6	2	Yellow	33,900	15,200	140
10	7	2	Green	35,600	18,400	130
11	8	2	Yellow	33,600	17,000	140
12		Total		304,100	149,600	1,130
13						

Assuming that you're Leann Brunswick, write a memo to Jamarcus Bradshaw with a recommendation to management. You should analyze the August data to determine whether the paper machine or the paper color explains the increase in the unit cost from July. Include any supporting schedules that are appropriate.

#### **CP 18-5** Process costing companies

#### **Group Project**

The following categories represent typical process manufacturing industries:

Beverages Metals

Chemicals Petroleum refining
Food Pharmaceuticals
Forest and paper products Soap and cosmetics

In groups of two or three, for each category identify one company (following your instructor's specific instructions) and determine the following:

- 1. Typical products manufactured by the selected company, including brand names
- 2. Typical raw materials used by the selected company
- 3. Types of processes used by the selected company

Use annual reports, the Internet, or library resources in doing this activity.

Internet Project



# Cost Behavior and Cost-Volume-Profit Analysis

# Ford Motor Company

aking a profit isn't easy for U.S. auto manufacturers like the **Ford Motor Company.** The cost of materials, labor, equipment, and advertising make it very expensive to produce cars and trucks.

How many cars does Ford need to produce and sell to break even? The answer depends on the relationship between Ford's sales revenue and costs. Some of Ford's costs, like direct labor and materials, will change in direct proportion to the number of vehicles that are built. Other costs, such as the costs of manufacturing equipment, are fixed and do not change with the number of vehicles that are produced. Ford will break even when it generates enough sales revenue to cover both its fixed and variable costs.

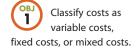
During the depths of the 2009 recession, Ford renegotiated labor contracts with their employees. These renegotiations reduced

the direct labor cost incurred to build each car, which lowered the number of cars that the company needed to sell to break even by 45%.

As with Ford, understanding how costs behave, and the relationship between costs, profits, and volume, is important for all businesses. This chapter discusses commonly used methods for classifying costs according to how they change and techniques for determining how many units must be sold for a company to break even. Techniques that management can use to evaluate costs in order to make sound business decisions are also discussed.

*Source*: J. Booton, "Moody's Upgrades Ford's Credit Rating, Returns Blue Oval Trademark," Fox Business, May 22, 2012.





# **Cost Behavior**

Cost behavior is the manner in which a cost changes as a related activity changes. The behavior of costs is useful to managers for a variety of reasons. For example, knowing how costs behave allows managers to predict profits as sales and production volumes change. Knowing how costs behave is also useful for estimating costs, which affects a variety of decisions such as whether to replace a machine.

Understanding the behavior of a cost depends on the following:

- Identifying the activities that cause the cost to change. These activities are called activity bases (or activity drivers).
- Specifying the range of activity over which the changes in the cost are of interest. This range of activity is called the **relevant range**.

To illustrate, assume that a hospital is concerned about planning and controlling patient food costs. A good activity base is the number of patients who *stay* overnight in the hospital. The number of patients who are *treated* is not as good an activity base because some patients are outpatients and, thus, do not consume food. Once an activity base is identified, food costs can then be analyzed over the range of the number of patients who normally stay in the hospital (the relevant range).

Costs are normally classified as variable costs, fixed costs, or mixed costs.

#### **Variable Costs**

**Variable costs** are costs that vary in proportion to changes in the activity base. When the activity base is units produced, direct materials and direct labor costs are normally classified as variable costs.

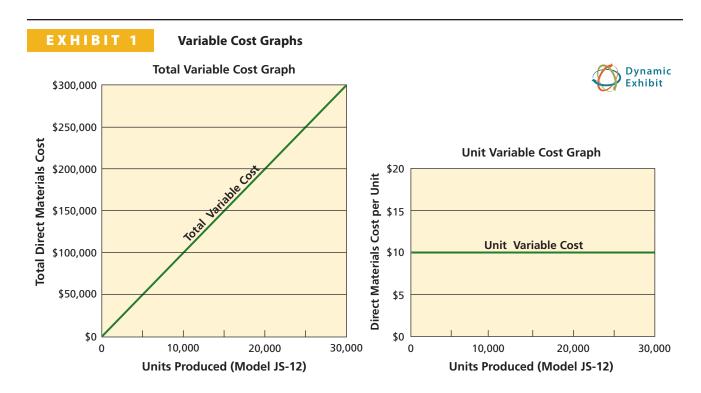
To illustrate, assume that Jason Sound Inc. produces stereo systems. The parts for the stereo systems are purchased from suppliers for \$10 per unit and are assembled by Jason Sound. For Model JS-12, the direct materials costs for the relevant range of 5,000 to 30,000 units of production are as follows:

Number of Units of Model JS-12 Produced	Direct Materials Cost per Unit	Total Direct Materials Cost
5,000 units	\$10	\$ 50,000
10,000	10	100,000
15,000	10	150,000
20,000	10	200,000
25,000	10	250,000
30,000	10	300,000

As shown, variable costs have the following characteristics:

- Cost per unit remains the same regardless of changes in the activity base. For Jason Sound, units produced is the activity base. For Model JS-12, the cost per unit is \$10.
- *Total cost* changes in proportion to changes in the activity base. For Model JS-12, the direct materials cost for 10,000 units (\$100,000) is twice the direct materials cost for 5,000 units (\$50,000).

Exhibit 1 illustrates how the variable costs for direct materials for Model JS-12 behave in total and on a per-unit basis as production changes.



Some examples of variable costs and their related activity bases for various types of businesses are shown in Exhibit 2.

#### **Variable Costs and Their Activity Bases**

Type of Business	Cost	Activity Base
University	Instructor salaries	Number of classes
Passenger airline	Fuel	Number of miles flown
Manufacturing	Direct materials	Number of units produced
Hospital	Nurse wages	Number of patients
Hotel	Maid wages	Number of guests
Bank	Teller wages	Number of banking transactions

#### **Fixed Costs**

**Fixed costs** are costs that remain the same in total dollar amount as the activity base changes. When the activity base is units produced, many factory overhead costs such as straight-line depreciation are classified as fixed costs.

To illustrate, assume that Minton Inc. manufactures, bottles, and distributes perfume. The production supervisor is Jane Sovissi, who is paid a salary of \$75,000 per year. For the relevant range of 50,000 to 300,000 bottles of perfume, the total fixed cost of \$75,000 does not vary as production increases. As a result, the fixed cost per bottle decreases as the units produced increase. This is because the fixed cost is spread over a larger number of bottles, as follows:

Number of Bottles of Perfume Produced	Total Salary for Jane Sovissi	Salary per Bottle of Perfume Produced
50,000 bottles	\$75,000	\$1.500
100,000	75,000	0.750
150,000	75,000	0.500
200,000	75,000	0.375
250,000	75,000	0.300
300,000	75,000	0.250

As shown, fixed costs have the following characteristics:

- Cost per unit decreases as the activity level increases and increases as the activity level decreases. For Jane Sovissi's salary, the cost per unit decreased from \$1.50 for 50,000 bottles produced to \$0.25 for 300,000 bottles produced.
- *Total cost* remains the same regardless of changes in the activity base. Jane Sovissi's salary of \$75,000 remained the same regardless of whether 50,000 bottles or 300,000 bottles were produced.

Exhibit 3 illustrates how Jane Sovissi's salary (fixed cost) behaves in total and on a per-unit basis as production changes.

Some examples of fixed costs and their related activity bases for various types of businesses are shown in Exhibit 4.

#### **Mixed Costs**

A salesperson's compensation can be a mixed cost comprised of a salary (fixed portion) plus a commission

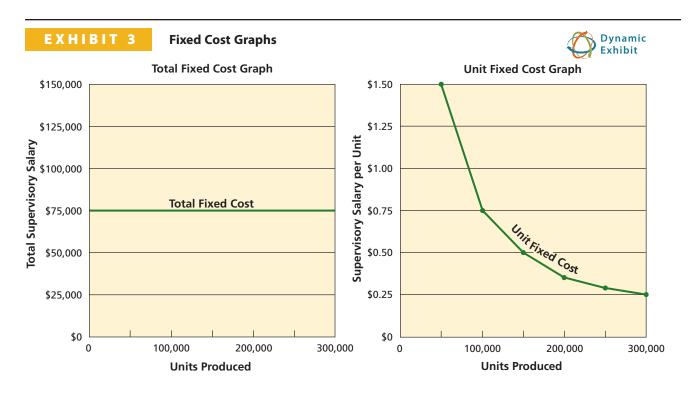
as a percent of sales

(variable portion).

**Mixed costs** are costs that have characteristics of both a variable and a fixed cost. Mixed costs are sometimes called *semivariable* or *semifixed costs*.

To illustrate, assume that Simpson Inc. manufactures sails, using rented machinery. The rental charges are as follows:

Rental Charge = \$15,000 per year + \$1 for each hour used in excess of 10,000 hours



**Fixed Costs and Their Activity Bases** 

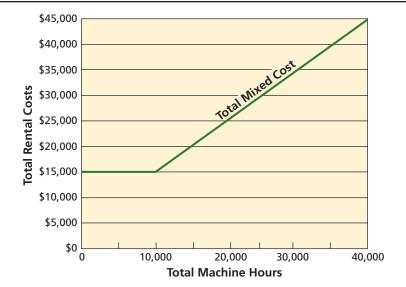
Type of Business	Fixed Cost	Activity Base
University	Building (straight-line) depreciation	Number of students
Passenger airline	Airplane (straight-line) depreciation	Number of miles flown
Manufacturing	Plant manager salary	Number of units produced
Hospital	Property insurance	Number of patients
Hotel	Property taxes	Number of guests
Bank	Branch manager salary	Number of customer accounts

The rental charges for various hours used within the relevant range of 8,000 hours to 40,000 hours are as follows:

Hours Used	Rental Charge
8,000 hours	\$15,000
12,000	\$17,000 {\$15,000 + [(12,000 hrs 10,000 hrs.) × \$1]}
20,000	\$25,000 {\$15,000 + [(20,000 hrs 10,000 hrs.) × \$1]}
40,000	\$45,000 {\$15,000 + [(40,000 hrs 10,000 hrs.) × \$1]}

Exhibit 5 illustrates the preceding mixed cost behavior.

**Mixed Costs** 



For purposes of analysis, mixed costs are usually separated into their fixed and variable components. The **high-low method** is a cost estimation method that may be used for this purpose.¹ The high-low method uses the highest and lowest activity levels and their related costs to estimate the variable cost per unit and the fixed cost.

To illustrate, assume that the Equipment Maintenance Department of Kason Inc. incurred the following costs during the past five months:

	Units Produced	Total Cost
June	1,000 units	\$45,550
July	1,500	52,000
August	2,100	61,500
September	1,800	57,500
October	750	41,250

The number of units produced is the activity base, and the relevant range is the units produced between June and October. For Kason, the difference between the units produced and the total costs at the highest and lowest levels of production are as follows:

	Units Produced	Total Cost
Highest level	2,100 units	\$61,500
Lowest level	750	41,250
Difference	1,350 units	\$20,250

The total fixed cost does not change with changes in production. Thus, the \$20,250 difference in the total cost is the change in the total variable cost. Dividing this difference of \$20,250 by the difference in production is an estimate of the variable cost per unit. For Kason, this estimate is \$15, computed as follows:

Variable Cost per Unit = 
$$\frac{\text{Difference in Total Cost}}{\text{Difference in Units Produced}}$$
$$= \frac{\$20,250}{1,350 \text{ units}} = \$15 \text{ per unit}$$

The fixed cost is estimated by subtracting the total variable costs from the total costs for the units produced, as follows:

Fixed Cost = Total Costs – (Variable Cost per Unit × Units Produced)

¹ Other methods of estimating costs, such as the scattergraph method and the least squares method, are discussed in cost accounting textbooks.

The fixed cost is the same at the highest and the lowest levels of production, as follows for Kason:

Highest level (2,100 units)

Fixed Cost = Total Costs – (Variable Cost per Unit  $\times$  Units Produced)

 $= $61,500 - ($15 \times 2,100 \text{ units})$ 

= \$61,500 - \$31,500

= \$30,000

Lowest level (750 units)

Fixed Cost = Total Costs – (Variable Cost per Unit × Units Produced)

 $= $41,250 - ($15 \times 750 \text{ units})$ 

= \$41,250 - \$11,250

= \$30,000

Using the variable cost per unit and the fixed cost, the total equipment maintenance cost for Kason can be computed for various levels of production as follows:

```
Total Cost = (Variable Cost per Unit \times Units Produced) + Fixed Costs = (\$15 \times \text{Units Produced}) + \$30,000
```

To illustrate, the estimated total cost of 2,000 units of production is \$60,000, computed as follows:

```
Total Cost = (\$15 \times \text{Units Produced}) + \$30,000
= (\$15 \times 2,000 \text{ units}) + \$30,000 = \$30,000 + \$30,000
= \$60.000
```

## Example Exercise 19-1 High-Low Method



The manufacturing costs of Alex Industries for the first three months of the year follow:

	Total Cost	Production
January	\$ 80,000	1,000 units
February	125,000	2,500
March	100,000	1,800

Using the high-low method, determine (a) the variable cost per unit and (b) the total fixed cost.

#### Follow My Example 19-1

- a.  $$30 \text{ per unit} = ($125,000 $80,000) \div (2,500 1,000)$
- b.  $$50,000 = $125,000 ($30 \times 2,500)$ , or  $$80,000 ($30 \times 1,000)$

Practice Exercises: PE 19-1A, PE 19-1B

# **Summary of Cost Behavior Concepts**

The cost behavior of variable costs and fixed costs is summarized in Exhibit 6.

Effect of Changing Activity Level			
Cost	Total Amount	Per-Unit Amount	
Variable	Increases and decreases proportionately with activity level.	Remains the same regardless of activity level.	
Fixed	Remains the same regardless of activity level.	Increases and decreases inversely with activity level.	

**EXHIBIT 6** 

Variable and Fixed Cost Behavior

Mixed costs contain a fixed cost component that is incurred even if nothing is produced. For analysis, the fixed and variable cost components of mixed costs are separated using the high-low method.

Exhibit 7 provides some examples of variable, fixed, and mixed costs for the activity base of units produced.

#### **EXHIBIT 7**

Variable, Fixed, and **Mixed Cost** 

<b>Variable Costs</b>	Fixed Costs	Mixed Costs
<ul> <li>Direct materials</li> </ul>	<ul> <li>Straight-line depreciation</li> </ul>	<ul> <li>Quality Control Department salaries</li> </ul>
<ul> <li>Direct labor</li> </ul>	<ul> <li>Property taxes</li> </ul>	<ul> <li>Purchasing Department salaries</li> </ul>
Electricity expense	<ul> <li>Production supervisor salaries</li> </ul>	<ul> <li>Maintenance expenses</li> </ul>
<ul> <li>Supplies</li> </ul>	Insurance expense	Warehouse expenses

One method of reporting variable and fixed costs is called variable costing or direct costing. Under variable costing, only the variable manufacturing costs (direct materials, direct labor, and variable factory overhead) are included in the product cost. The fixed factory overhead is treated as an expense of the period in which it is incurred. Variable costing is described and illustrated in the appendix to this chapter.

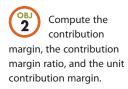


# Business **K** Connection

#### **FRANCHISING**

Many restaurant chains such as McDonald's, Wendy's, Dunkin' Donuts, and Fatburger operate as franchises. In a franchise, the restaurant chain (called the *franchisor*) sells the right to sell products using its trademark or brand name to a franchisee. The franchisee typically pays an initial franchise fee, which is a fixed cost. In addition, the franchisee must normally make royalty payments to the franchisor based on a percentage of sales revenues, which is a variable cost. Prior to signing a franchise agreement, most franchisees conduct a break-even analysis to determine how much sales volume their franchise must generate to earn a profit. For example, McDonald's franchises require an initial investment of more than \$500,000 and typically take several years to break even.

Source: B. Beshel, An Introduction to Franchising, IFA Educational Foundation, 2000.



# **Cost-Volume-Profit Relationships**

Cost-volume-profit analysis is the examination of the relationships among selling prices, sales and production volume, costs, expenses, and profits. Cost-volume-profit analysis is useful for managerial decision making. Some of the ways cost-volumeprofit analysis may be used include the following:

- Analyzing the effects of changes in selling prices on profits
- Analyzing the effects of changes in costs on profits
- Analyzing the effects of changes in volume on profits
- Setting selling prices
- Selecting the mix of products to sell
- Choosing among marketing strategies

# Contribution Margin

Contribution margin is especially useful because it provides insight into the profit potential of a company. Contribution margin is the excess of sales over variable costs, computed as follows:

Contribution Margin = Sales - Variable Costs

To illustrate, assume the following data for Lambert Inc.:

Sales 50,000 units
Sales price per unit \$20 per unit
Variable cost per unit \$12 per unit
Fixed costs \$300,000

Exhibit 8 illustrates an income statement for Lambert prepared in a contribution margin format.

Sales (50,000 units × \$20)	\$1,000,000
Variable costs (50,000 units × \$12)	600,000
Contribution margin (50,000 units × \$8)	\$ 400,000
Fixed costs	300,000
Income from operations	\$ 100,000

#### **EXHIBIT 8**

Contribution Margin Income Statement Format

Lambert's contribution margin of \$400,000 is available to cover the fixed costs of \$300,000. Once the fixed costs are covered, any additional contribution margin increases income from operations.



A room night at **Hilton Hotels** has a high

contribution margin. The high contribution margin per room night is necessary to cover the high fixed costs of the hotel.

## **Contribution Margin Ratio**

Contribution margin can also be expressed as a percentage. The **contribution margin ratio**, sometimes called the *profit-volume ratio*, indicates the percentage of each sales dollar available to cover fixed costs and to provide income from operations. The contribution margin ratio is computed as follows:

$$Contribution Margin Ratio = \frac{Contribution Margin}{Sales}$$

The contribution margin ratio is 40% for Lambert Inc., computed as follows:

Contribution Margin Ratio = 
$$\frac{$400,000}{$1,000,000} = 40\%$$

The contribution margin ratio is most useful when the increase or decrease in sales volume is measured in sales *dollars*. In this case, the change in sales dollars multiplied by the contribution margin ratio equals the change in income from operations, computed as follows:

Change in Income from Operations = Change in Sales Dollars  $\times$  Contribution Margin Ratio

To illustrate, if Lambert adds \$80,000 in sales from the sale of an additional 4,000 units, its income from operations will increase by \$32,000, computed as follows:

Change in Income from Operations = Change in Sales Dollars  $\times$  Contribution Margin Ratio Change in Income from Operations =  $\$80,000 \times 40\% = \$32,000$ 

The preceding analysis is confirmed by the contribution margin income statement of Lambert that follows:

Sales (54,000 units × \$20)	\$1	1,080,000
Variable costs (54,000 units × \$12)		648,000*
Contribution margin (54,000 units × \$8)	\$	432,000**
Fixed costs		300,000
Income from operations	\$	132,000

^{*\$1,080,000 × 60%} 

^{**\$1,080,000 × 40%} 

Income from operations increased from \$100,000 to \$132,000 when sales increased from \$1,000,000 to \$1,080,000. Variable costs as a percentage of sales are equal to 100% minus the contribution margin ratio. Thus, in the preceding income statement, the variable costs are 60% (100% - 40%) of sales, or \$648,000 ( $$1,080,000 \times 60\%$ ). The total contribution margin, \$432,000, can also be computed directly by multiplying the total sales by the contribution margin ratio ( $$1,080,000 \times 40\%$ ).

In the preceding analysis, factors other than sales volume, such as variable cost per unit and sales price, are assumed to remain constant. If such factors change, their effect must also be considered.

The contribution margin ratio is also useful in developing business strategies. For example, assume that a company has a high contribution margin ratio and is producing below 100% of capacity. In this case, a large increase in income from operations can be expected from an increase in sales volume. Therefore, the company might consider implementing a special sales campaign to increase sales. In contrast, a company with a small contribution margin ratio will probably want to give more attention to reducing costs before attempting to promote sales.

## **Unit Contribution Margin**

The unit contribution margin is also useful for analyzing the profit potential of proposed decisions. The **unit contribution margin** is computed as follows:

Unit Contribution Margin = Sales Price per Unit – Variable Cost per Unit

To illustrate, if Lambert Inc.'s unit selling price is \$20 and its variable cost per unit is \$12, the unit contribution margin is \$8, computed as follows:

```
Unit Contribution Margin = Sales Price per Unit – Variable Cost per Unit Unit Contribution Margin = $20 – $12 = $8
```

The unit contribution margin is most useful when the increase or decrease in sales volume is measured in sales *units* (quantities). In this case, the change in sales volume (units) multiplied by the unit contribution margin equals the change in income from operations, computed as follows:

Change in Income from Operations = Change in Sales Units × Unit Contribution Margin

To illustrate, assume that Lambert's sales could be increased by 15,000 units, from 50,000 units to 65,000 units. Lambert's income from operations would increase by  $$120,000 (15,000 \text{ units} \times \$8)$ , computed as follows:

```
Change in Income from Operations = Change in Sales Units \times Unit Contribution Margin Change in Income from Operations = 15,000 units \times $8 = $120,000
```

The preceding analysis is confirmed by the contribution margin income statement of Lambert that follows, which shows that income increased to \$220,000 when 65,000 units are sold. The income statement in Exhibit 8 indicates income of \$100,000 when 50,000 units are sold. Thus, selling an additional 15,000 units increases income by \$120,000 (\$220,000 - \$100,000).

Sales (65,000 units × \$20)	\$1,300,000
Variable costs (65,000 units × \$12)	780,000
Contribution margin (65,000 units × \$8)	\$ 520,000
Fixed costs	300,000
Income from operations	\$ 220,000

Unit contribution margin analysis is useful information for managers. For example, in the preceding illustration, Lambert could spend up to \$120,000 for special advertising or other product promotions to increase sales by 15,000 units and still increase income by \$100,000, the \$220,000 increase in sales minus the \$120,000 cost of special advertising.

#### Example Exercise 19-2 Contribution Margin





Molly Company sells 20,000 units at \$12 per unit. Variable costs are \$9 per unit, and fixed costs are \$25,000. Determine the (a) contribution margin ratio, (b) unit contribution margin, and (c) income from operations.

#### Follow My Example 19-2

a.  $25\% = (\$12 - \$9) \div \$12$ , or  $(\$240,000 - \$180,000) \div \$240,000$ 

b. \$3 per unit = \$12 - \$9

c. Sales \$240,000 (20,000 units  $\times$  \$12 per unit) Variable costs  $\frac{180,000}{5000}$  (20,000 units  $\times$  \$9 per unit) Contribution margin \$60,000 [20,000 units  $\times$  (\$12 - \$9)] Fixed costs  $\frac{25,000}{5000}$  Income from operations \$35,000

Practice Exercises: PE 19-2A, PE 19-2B

# Mathematical Approach to Cost-Volume-Profit Analysis

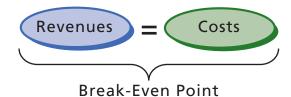


The mathematical approach to cost-volume-profit analysis uses equations to determine the following:

- Sales necessary to break even
- Sales necessary to make a target or desired profit

#### **Break-Even Point**

The **break-even point** is the level of operations at which a company's revenues and expenses are equal, as shown in Exhibit 9. At break-even, a company reports neither income nor a loss from operations.



**EXHIBIT 9** 

**Break-Even Point** 

The break-even point in sales units is computed as follows:

$$Break-Even \ Sales \ (units) = \frac{Fixed \ Costs}{Unit \ Contribution \ Margin}$$

To illustrate, assume the following data for Baker Corporation:

Fixed costs	\$90,000
Unit selling price	\$25
Unit variable cost	15
Unit contribution margin	\$10

The break-even point for Baker is 9,000 units, computed as follows:

Break-Even Sales (units) = 
$$\frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} = \frac{\$90,000}{\$10} = 9,000 \text{ units}$$

The following income statement for Baker verifies the break-even point of 9,000 units:

Sales (9,000 units × \$25)	\$225,	000
Variable costs (9,000 units × \$15)	135,0	000
Contribution margin	\$ 90,0	000
Fixed costs	90,0	000
Income from operations	\$	0

As shown in Baker's income statement, the break-even point is  $$225,000 (9,000 \text{ units} \times $25)$  of sales. The break-even point in *sales dollars* can be determined directly as follows:

$$\mbox{Break-Even Sales (dollars)} = \frac{\mbox{Fixed Costs}}{\mbox{Contribution Margin Ratio}}$$

The contribution margin ratio can be computed using the unit contribution margin and unit selling price as follows:

$$\mbox{Contribution Margin Ratio} = \frac{\mbox{Unit Contribution Margin}}{\mbox{Unit Selling Price}}$$

The contribution margin ratio for Baker is 40%, computed as follows:

Contribution Margin Ratio = 
$$\frac{\text{Unit Contribution Margin}}{\text{Unit Selling Price}} = \frac{\$10}{\$25} = 40\%$$

Thus, the break-even sales dollars for Baker of \$225,000 can be computed directly as follows:

Break-Even Sales (dollars) 
$$=\frac{\text{Fixed Costs}}{\text{Contribution Margin Ratio}} = \frac{\$90,000}{40\%} = \$225,000$$

The break-even point is affected by changes in the fixed costs, unit variable costs, and the unit selling price.

**Effect of Changes in Fixed Costs** Fixed costs do not change in total with changes in the level of activity. However, fixed costs may change because of other factors such as advertising campaigns, changes in property tax rates, or changes in factory supervisors' salaries.

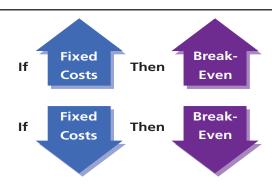
Changes in fixed costs affect the break-even point as follows:

- Increases in fixed costs increase the break-even point.
- Decreases in fixed costs decrease the break-even point.

This relationship is illustrated in Exhibit 10.

#### **EXHIBIT 10**

Effect of Change in Fixed Costs on Break-Even Point



To illustrate, assume that Bishop Co. is evaluating a proposal to budget an additional \$100,000 for advertising. The data for Bishop follows:

	Current	Proposed
Unit selling price	\$90	\$90
Unit variable cost	70	70
Unit contribution margin	\$20	\$20
Fixed costs	\$600.000	\$700.000

Bishop's break-even point *before* the additional advertising expense of \$100,000 is 30,000 units, computed as follows:

Break-Even Sales (units) = 
$$\frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} = \frac{\$600,000}{\$20} = 30,000 \text{ units}$$

Bishop's break-even point *after* the additional advertising expense of \$100,000 is 35,000 units, computed as follows:

$$\text{Break-Even Sales (units)} = \frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} = \frac{\$700,000}{\$20} = 35,000 \text{ units}$$

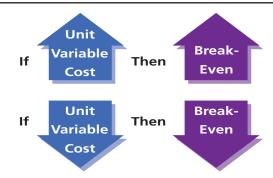
As shown for Bishop, the \$100,000 increase in advertising (fixed costs) requires an additional 5,000 units (35,000 - 30,000) of sales to break even.² In other words, an increase in sales of 5,000 units is required in order to generate an additional \$100,000 of total contribution margin (5,000 units × \$20) to cover the increased fixed costs.

**Effect of Changes in Unit Variable Costs** Unit variable costs do not change with changes in the level of activity. However, unit variable costs may be affected by other factors such as changes in the cost per unit of direct materials, changes in the wage rate for direct labor, or changes in the sales commission paid to salespeople.

Changes in unit variable costs affect the break-even point as follows:

- Increases in unit variable costs increase the break-even point.
- Decreases in unit variable costs decrease the break-even point.

This relationship is illustrated in Exhibit 11.



#### **EXHIBIT 11**

Effect of Change in Unit Variable Cost on Break-Even Point

To illustrate, assume that Park Co. is evaluating a proposal to pay an additional 2% commission on sales to its salespeople as an incentive to increase sales. The data for Park follows:

	Current	Proposed
Unit selling price	\$250	\$250
Unit variable cost	145	_150*
Unit contribution margin	\$105	\$100
Fixed costs	\$840,000	\$840,000

 *150 = $145 + (2\% \}times $250 \text{ unit selling price}).$ 

Park's break-even point *before* the additional 2% commission is 8,000 units, computed as follows:

Break-Even Sales (units) = 
$$\frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} = \frac{\$840,000}{\$105} = 8,000 \text{ units}$$

 $^{^2}$ The increase of 5,000 units can also be computed by dividing the increase in fixed costs of \$100,000 by the unit contribution margin, \$20, as follows: 5,000 units = \$100,000  $\div$  \$20.

If the 2% sales commission proposal is adopted, unit variable costs will increase by \$5 ( $$250 \times 2\%$ ), from \$145 to \$150 per unit. This increase in unit variable costs will decrease the unit contribution margin from \$105 to \$100 (\$250 - \$150). Thus, Park's break-even point *after* the additional 2% commission is 8,400 units, computed as follows:

$$\text{Break-Even Sales (units)} = \frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} = \frac{\$840,000}{\$100} = 8,400 \text{ units}$$

As shown for Park, an additional 400 units of sales will be required in order to break even. This is because if 8,000 units are sold, the new unit contribution margin of \$100 provides only \$800,000 (8,000 units  $\times$  \$100) of contribution margin. Thus, \$40,000 more contribution margin is necessary to cover the total fixed costs of \$840,000. This additional \$40,000 of contribution margin is provided by selling 400 more units (400 units  $\times$  \$100).

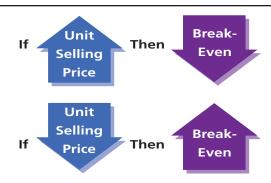
**Effect of Changes in Unit Selling Price** Changes in the unit selling price affect the unit contribution margin and, thus, the break-even point. Specifically, changes in the unit selling price affect the break-even point as follows:

- Increases in the unit selling price decrease the break-even point.
- Decreases in the unit selling price increase the break-even point.

This relationship is illustrated in Exhibit 12.

#### EXHIBIT 12

Effect of Change in Unit Selling Price on Break-Even Point



To illustrate, assume that Graham Co. is evaluating a proposal to increase the unit selling price of its product from \$50 to \$60. The data for Graham follows:

	Current	Proposed
Unit selling price	\$50	\$60
Unit variable cost	30	30
Unit contribution margin	\$20	\$30
Fixed costs	\$600,000	\$600,000

Graham's break-even point *before* the price increase is 30,000 units, computed as follows:

Break-Even Sales (units) = 
$$\frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} = \frac{\$600,000}{\$20} = 30,000 \text{ units}$$

The increase of \$10 per unit in the selling price increases the unit contribution margin by \$10. Thus, Graham's break-even point *after* the price increase is 20,000 units, computed as follows:

Break-Even Sales (units) = 
$$\frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} = \frac{\$600,000}{\$30} = 20,000 \text{ units}$$

As shown for Graham, the price increase of \$10 increased the unit contribution margin by \$10, which decreased the break-even point by 10,000 units (30,000 units - 20,000 units).

Summary of Effects of Changes on Break-Even Point The break-even point in sales changes in the same direction as changes in the variable cost per unit and fixed costs. In contrast, the break-even point in sales changes in the opposite direction as changes in the unit selling price. These changes on the break-even point in sales are summarized in Exhibit 13.

Type of Change	Direction of Change	Effect of Change on Break-Even Sales
Fixed cost	<b>†</b>	<b>†</b>
Unit variable cost	<b>+ +</b>	<b>*</b>
Unit selling price	<b>*</b>	<b>+</b>

#### **EXHIBIT 13**

**Effects of Changes** in Selling Price and **Costs on Break-Even** Point.

# Example Exercise 19-3 Break-Even Point



Nicolas Enterprises sells a product for \$60 per unit. The variable cost is \$35 per unit, while fixed costs are \$80,000. Determine the (a) break-even point in sales units and (b) break-even point in sales units if the selling price were increased to \$67 per unit.

#### Follow My Example 19-3

- a.  $3,200 \text{ units} = \$80,000 \div (\$60 \$35)$
- b.  $2,500 \text{ units} = \$80,000 \div (\$67 \$35)$

Practice Exercises: PE 19-3A, PE 19-3B



# 

#### **BREAKING EVEN IN THE AIRLINE INDUSTRY**

Airlines have high fixed costs and operate in a very competitive industry. As a result, many airlines struggle to break even. In the late 2000s, many of the major airlines were unable to break even and filed bankruptcy. After emerging from bankruptcy, several airlines merged in an attempt to reduce their cost structure and become more competitive. As the table shows, airlines like United Airlines, Southwest Airlines, Delta Air Lines, and American Airlines still face challenges in breaking even, as a small change in ticket prices determines whether an airline is able to break even.

	United	Southwest	Delta	American
Average one-way airfare per passenger*	\$269.56	\$141.14	\$209.60	\$208.59
Average cost per passenger*	240.25	133.68	184.88	209.67
* Airfare and cost data obtained from AirlineFinancials com				

# **Target Profit**

At the break-even point, sales and costs are exactly equal. However, the goal of most companies is to make a profit.

By modifying the break-even equation, the sales required to earn a target or desired amount of profit may be computed. For this purpose, target profit is added to the break-even equation, as follows:

$$\mbox{Sales (units)} = \frac{\mbox{Fixed Costs} + \mbox{Target Profit}}{\mbox{Unit Contribution Margin}}$$

To illustrate, assume the following data for Waltham Co.:

Fixed costs	\$200,000
Target profit	100,000
Unit selling price	\$75
Unit variable cost	_45
Unit contribution margin	\$30

The sales necessary for Waltham to earn the target profit of \$100,000 would be 10,000 units, computed as follows:

$$Sales (units) = \frac{Fixed \ Costs + Target \ Profit}{Unit \ Contribution \ Margin} = \frac{\$200,000 + \$100,000}{\$30} = 10,000 \ units$$

The following income statement for Waltham verifies this computation:

Sales (10,000 units × \$75)	\$750,000
Variable costs (10,000 units × \$45)	450,000
Contribution margin (10,000 units × \$30)	\$300,000
Fixed costs	200,000
Income from operations	\$100,000 ← Target profit
	——— profit

As shown in the income statement for Waltham, sales of \$750,000 (10,000 units  $\times$  \$75) are necessary to earn the target profit of \$100,000. The sales of \$750,000 needed to earn the target profit of \$100,000 can be computed directly using the contribution margin ratio, computed as follows:

Contribution Margin Ratio = 
$$\frac{\text{Unit Contribution Margin}}{\text{Unit Selling Price}} = \frac{\$30}{\$75} = 40\%$$

Sales (dollars) =  $\frac{\text{Fixed Costs + Target Profit}}{\text{Contribution Margin Ratio}}$ 

$$= \frac{\$200,000 + \$100,000}{40\%} = \frac{\$300,000}{40\%} = \$750,000$$

# Example Exercise 19-4 Target Profit

OBJ 3

Forest Company sells a product for \$140 per unit. The variable cost is \$60 per unit, and fixed costs are \$240,000. Determine the (a) break-even point in sales units and (b) the sales units required to achieve a target profit of \$50,000.

## Follow My Example 19-4

- a.  $3,000 \text{ units} = $240,000 \div ($140 $60)$
- b.  $3,625 \text{ units} = (\$240,000 + \$50,000) \div (\$140 \$60)$

Practice Exercises: PE 19-4A, PE 19-4B

# Integrity, Objectivity, and Ethics in Business



#### **ORPHAN DRUGS**

Each year, pharmaceutical companies develop new drugs that cure a variety of physical conditions. In order to be profitable, drug companies must sell enough of a product for a reasonable price to exceed break even. Breakeven points, however, create a problem for drugs, called "orphan drugs," targeted at rare diseases. These drugs are typically expensive to develop and have low sales volumes, making it impossible to achieve break even. To ensure that orphan drugs are not overlooked, Congress

passed the Orphan Drug Act, which provides incentives for pharmaceutical companies to develop drugs for rare diseases that might not generate enough sales to reach break even. The program has been a great success. Since 1982, more than 200 orphan drugs have come to market, including Jacobus Pharmaceuticals Company, Inc.'s drug for the treatment of tuberculosis and Novartis AG's drug for the treatment of Paget's disease.

# **Graphic Approach to Cost-Volume-Profit Analysis**

Cost-volume-profit analysis can be presented graphically as well as in equation form. Many managers prefer the graphic form because the operating profit or loss for different levels can be easily seen.

# Using a costvolume-profit

chart and a profit-volume chart, determine the break-even point and sales necessary to achieve a target profit.

#### **Cost-Volume-Profit (Break-Even) Chart**

A **cost-volume-profit chart**, sometimes called a *break-even chart*, graphically shows sales, costs, and the related profit or loss for various levels of units sold. It assists in understanding the relationship among sales, costs, and operating profit or loss.

To illustrate, the cost-volume-profit chart in Exhibit 14 is based on the following data for Munoz Co.:

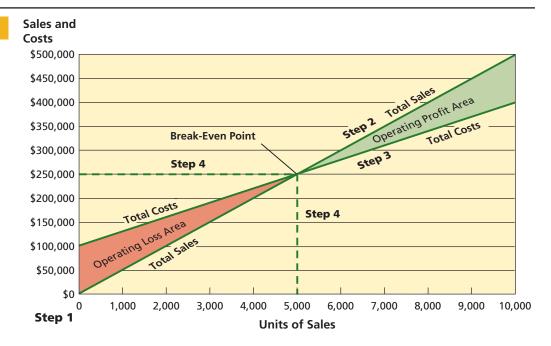
Total fixed costs	\$100,000
Unit selling price	\$50
Unit variable cost	_30
Unit contribution margin	\$20

The cost-volume-profit chart in Exhibit 14 is constructed using the following steps:

- Step 1. Volume in units of sales is indicated along the horizontal axis. The range of volume shown is the relevant range in which the company expects to operate.
   Dollar amounts of total sales and total costs are indicated along the vertical axis.
- Step 2. A total sales line is plotted by connecting the point at zero on the left corner of the graph to a second point on the chart. The second point is determined by multiplying the maximum number of units in the relevant range, which is found on the far right of the horizontal axis, by the unit sales price. A line is then drawn through both of these points. This is the total sales line. For Munoz, the maximum number of units in the relevant range is 10,000. The second point on the line is determined by multiplying the 10,000 units by the \$50 unit selling price to get the second point for the total sales line of \$500,000 (10,000 units × \$50). The sales line is drawn upward to the right from zero through the \$500,000 point at the end of the relevant range.
- Step 3. A total cost line is plotted by beginning with total fixed costs on the vertical axis. A second point is determined by multiplying the maximum number of units in the relevant range, which is found on the far right of the horizontal axis by the unit variable costs and adding the total fixed costs. A line is then drawn through both of these points. This is the total cost line. For Munoz, the maximum number of units in the relevant range is 10,000. The second point on the line is determined by multiplying the 10,000 units by the \$30 unit variable

- cost and then adding the \$100,000 total fixed costs to get the second point for the total estimated costs of \$400,000 [(10,000 units  $\times$  \$30) + \$100,000]. The cost line is drawn upward to the right from \$100,000 on the vertical axis through the \$400,000 point at the end of the relevant range.
- Step 4. The break-even point is the intersection point of the total sales and total cost lines. A vertical dotted line drawn downward at the intersection point indicates the units of sales at the break-even point. A horizontal dotted line drawn to the left at the intersection point indicates the sales dollars and costs at the break-even point.

# Cost-Volume-Profit Chart



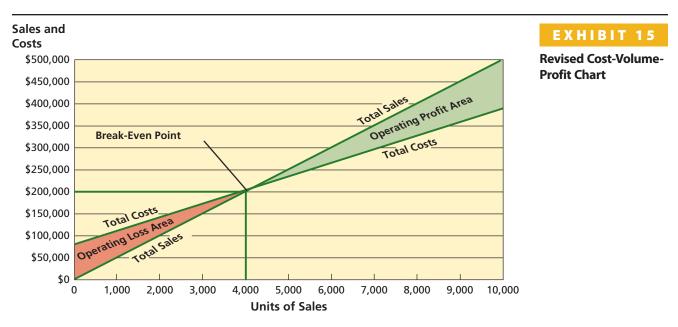
In Exhibit 14, the break-even point for Munoz is \$250,000 of sales, which represents sales of 5,000 units. Operating profits will be earned when sales levels are to the right of the break-even point (*operating profit area*). Operating losses will be incurred when sales levels are to the left of the break-even point (*operating loss area*).

Changes in the unit selling price, total fixed costs, and unit variable costs can be analyzed by using a cost-volume-profit chart. Using the data in Exhibit 14, assume that Munoz is evaluating a proposal to reduce fixed costs by \$20,000. In this case, the total fixed costs would be \$80,000 (\$100,000 - \$20,000).

Under this scenario, the total sales line is not changed, but the total cost line will change. As shown in Exhibit 15, the total cost line is redrawn, starting at the \$80,000 point (total fixed costs) on the vertical axis. The second point is determined by multiplying the maximum number of units in the relevant range, which is found on the far right of the horizontal axis, by the unit variable costs and adding the fixed costs. For Munoz, this is the total estimated cost for 10,000 units, which is \$380,000 [(10,000 units × \$30) + \$80,000]. The cost line is drawn upward to the right from \$80,000 on the vertical axis through the \$380,000 point. The revised cost-volume-profit chart in Exhibit 15 indicates that the break-even point for Munoz decreases to \$200,000 and 4,000 units of sales.

#### **Profit-Volume Chart**

Another graphic approach to cost-volume-profit analysis is the profit-volume chart. The **profit-volume chart** plots only the difference between total sales and total costs (or profits). In this way, the profit-volume chart allows managers to determine the operating profit (or loss) for various levels of units sold.



To illustrate, the profit-volume chart for Munoz Co. in Exhibit 16 is based on the same data as used in Exhibit 14. These data are as follows:

Total fixed costs	\$100,000
Unit selling price	\$50
Unit variable cost	_30
Unit contribution margin	\$20

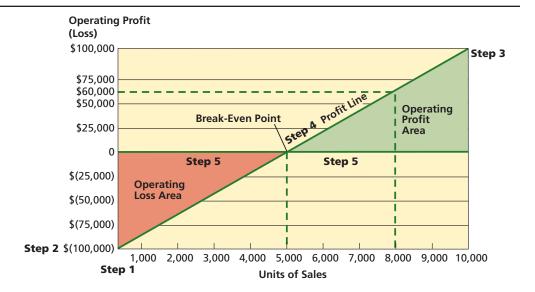
The maximum operating loss is equal to the fixed costs of \$100,000. Assuming that the maximum units that can be sold within the relevant range is 10,000 units, the maximum operating profit is \$100,000, computed as follows:

Sales (10,000 units × \$50)	\$500,000
Variable costs (10,000 units × \$30)	_300,000
Contribution margin (10,000 units × \$20)	\$200,000
Fixed costs	100,000
Operating profit	\$100,000 Maximum
	profit

The profit-volume chart in Exhibit 16 is constructed using the following steps:

- Step 1. Volume in units of sales is indicated along the horizontal axis. The range of volume shown is the relevant range in which the company expects to operate. In Exhibit 16, the maximum units of sales is 10,000 units. Dollar amounts indicating operating profits and losses are shown along the vertical axis.
- Step 2. A point representing the maximum operating loss is plotted on the vertical axis at the left. This loss is equal to the total fixed costs at the zero level of sales. Thus, the maximum operating loss is equal to the fixed costs of \$100,000.
- Step 3. A point representing the maximum operating profit within the relevant range is plotted on the right. Assuming that the maximum unit sales within the relevant range is 10,000 units, the maximum operating profit is \$100,000.
- Step 4. A diagonal profit line is drawn connecting the maximum operating loss point with the maximum operating profit point.
- Step 5. The profit line intersects the horizontal zero operating profit line at the breakeven point in units of sales. The area indicating an operating profit is identified to the right of the intersection, and the area indicating an operating loss is identified to the left of the intersection.

**Profit-Volume Chart** 



In Exhibit 16, the break-even point for Munoz is 5,000 units of sales, which is equal to total sales of \$250,000 (5,000 units × \$50). Operating profit will be earned when sales levels are to the right of the break-even point (*operating profit area*). Operating losses will be incurred when sales levels are to the left of the break-even point (*operating loss area*). For example, at sales of 8,000 units, an operating profit of \$60,000 will be earned, as shown in Exhibit 16.

The effect of changes in the unit selling price, total fixed costs, and unit variable costs on profit can be analyzed using a profit-volume chart. Using the data in Exhibit 16, consider the effect that a \$20,000 increase in fixed costs will have on profit. In this case, the total fixed costs will increase to \$120,000 (\$100,000 + \$20,000), and the maximum operating loss will also increase to \$120,000. At the maximum sales of 10,000 units, the maximum operating profit would be \$80,000, computed as follows:

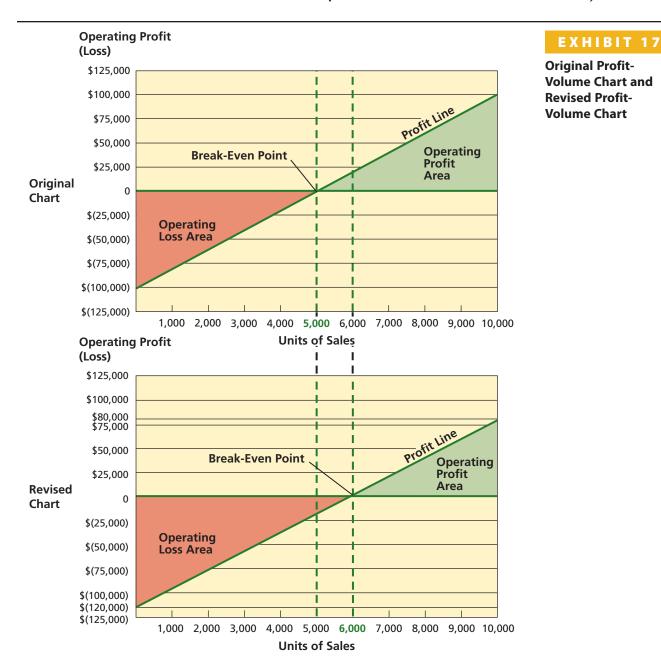


A revised profit-volume chart is constructed by plotting the maximum operating loss and maximum operating profit points and drawing the revised profit line. The original and the revised profit-volume charts for Munoz are shown in Exhibit 17.

The revised profit-volume chart indicates that the break-even point for Munoz is 6,000 units of sales. This is equal to total sales of \$300,000 (6,000 units  $\times$  \$50). The operating loss area of the chart has increased, while the operating profit area has decreased.

# **Use of Computers in Cost-Volume-Profit Analysis**

With computers, the graphic approach and the mathematical approach to cost-volume-profit analysis are easy to use. Managers can vary assumptions regarding selling prices, costs, and volume and can observe the effects of each change on the break-even point and profit. Such an analysis is called a "what if" analysis or sensitivity analysis.



## **Assumptions of Cost-Volume-Profit Analysis**

Cost-volume-profit analysis depends on several assumptions. The primary assumptions are as follows:

- Total sales and total costs can be represented by straight lines.
- Within the relevant range of operating activity, the efficiency of operations does not change.
- Costs can be divided into fixed and variable components.
- The sales mix is constant.
- There is no change in the inventory quantities during the period.

These assumptions simplify cost-volume-profit analysis. Because they are often valid for the relevant range of operations, cost-volume-profit analysis is useful for decision making.³

³ The impact of violating these assumptions is discussed in advanced accounting texts.

## Service Focus



#### PROFIT, LOSS, AND BREAK-EVEN IN **MAJOR LEAGUE BASEBALL**

Major League Baseball is a tough game and a tough business. Ticket prices (unit selling price), player salaries (variable costs), stadium fees (fixed costs), and attendance (volume) converge to make it difficult for teams to make a profit, or at least break even. So, which major league baseball team was the most profitable in 2013? Well, it wasn't the World Champion Boston Red Sox. Nor was it the star-studded New York Yankees. Then, it had to be the recently turned around Los Angeles Angels, right? Not even close. It was actually the worst team in baseball—the Houston Astros.

Just how profitable were the Astros? They earned \$99 million in 2013, which was more than the combined 2013 profits of the six most recent World Series champions. How could the team with the worst record in baseball since 2005 have one of the most profitable years in baseball history? By paying careful attention to costs and volume. Between 2011 and 2013, the Astros cut their player payroll from \$56 million to less than \$13 million. That's right, all of the players on the Houston Astros baseball team combined, made less in 2013 than Alex Rodriguez (New York Yankees), Cliff Lee (Philadelphia Phillies), Prince Fielder (Detroit Tigers), and Tim Lincecum (San Francisco Giants) made individually. While attendance at Astros games has dropped by around 20% since 2011, the cost reductions from reduced player salaries have far outpaced the drop in attendance, making the 2013 Astros the most profitable team in baseball history. While no one likes losing baseball games, the Houston Astros have shown that focusing on the relationship between cost and volume can yield a hefty profit, even when they aren't winning.

Source: D. Alexander, "2013 Houston Astros: Baseball's Worst Team Is The Most Profitable In History," Forbes, August 26, 2013.



Compute the break-even

point for a company selling more than one product, the operating leverage, and the margin of safety.

## **Special Cost-Volume-Profit Relationships**

Cost-volume-profit analysis can also be used when a company sells several products with different costs and prices. In addition, operating leverage and the margin of safety are useful in analyzing cost-volume-profit relationships.

#### Sales Mix Considerations

Many companies sell more than one product at different selling prices. In addition, the products normally have different unit variable costs and, thus, different unit contribution margins. In such cases, break-even analysis can still be performed by considering the sales mix. The sales mix is the relative distribution of sales among the products sold by a company.

To illustrate, assume that Cascade Company sold Products A and B during the past year, as follows:

Total fixed costs	\$200,000	
	Product A	Product B
Unit selling price	\$90	\$140
Unit variable cost	70	95
Unit contribution margin		\$ 45
Units sold	8,000	2,000
Sales mix	80%	20%

The sales mix for Products A and B is expressed as a percentage of total units sold. For Cascade, a total of 10,000 (8,000 + 2,000) units were sold during the year. Therefore, the sales mix is 80% (8,000 ÷ 10,000) for Product A and 20% for Product B (2,000 ÷ 10,000), as shown in Exhibit 18. The sales mix could also be expressed as the ratio 80:20.



#### **EXHIBIT 18**

Multiple Product
Sales Mix

For break-even analysis, it is useful to think of Products A and B as components of one overall enterprise product called E. The unit selling price of E equals the sum of the unit selling prices of each product multiplied by its sales mix percentage. Likewise, the unit variable cost and unit contribution margin of E equal the sum of the unit variable costs and unit contribution margins of each product multiplied by its sales mix percentage.

For Cascade, the unit selling price, unit variable cost, and unit contribution margin for E are computed as follows:

Product E	Product A	Product B
Unit selling price of E	\$100 = (\$90 × 0.8) +	(\$140 × 0.2)
Unit variable cost of E	$_{-75} = ($70 \times 0.8) +$	$($95 \times 0.2)$
Unit contribution margin of E	$\$ 25 = (\$20 \times 0.8) +$	$($45 \times 0.2)$

Cascade has total fixed costs of \$200,000. The break-even point of 8,000 units of E can be determined as follows using the unit selling price, unit variable cost, and unit contribution margin of E:

Break-Even Sales (units) for E = 
$$\frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} = \frac{\$200,000}{\$25} = 8,000 \text{ units}$$

Because the sales mix for Products A and B is 80% and 20% respectively, the break-even quantity of A is 6,400 units (8,000 units  $\times$  80%) and B is 1,600 units (8,000 units  $\times$  20%). The preceding break-even analysis is verified in Exhibit 19.

	Product A	Product B	Total	EXHIBIT 1
Sales:				Break-Even Sales:
6,400 units × \$90	\$576,000		\$576,000	Multiple Products
1,600 units × \$140		\$224,000	224,000	İ
Total sales	\$576,000	\$224,000	\$800,000	
Variable costs:				
6,400 units × \$70	\$448,000		\$448,000	
1,600 units × \$95		\$152,000	152,000	
Total variable costs	\$448,000	\$152,000	\$600,000	
Contribution margin	\$128,000	\$ 72,000	\$200,000	
Fixed costs			200,000	Break-even
Income from operations			\$ 0	point

The effects of changes in the sales mix on the break-even point can be determined by assuming a different sales mix. The break-even point of E can then be recomputed.

## Example Exercise 19-5 Sales Mix and Break-Even Analysis



Megan Company has fixed costs of \$180,000. The unit selling price, variable cost per unit, and contribution margin per unit for the company's two products are as follows:

Product	Selling Price	Variable Cost per Unit	Contribution Margin per Unit	
Q	\$160	\$100	\$60	
Z	100	80	20	

The sales mix for products Q and Z is 75% and 25%, respectively. Determine the break-even point in units of Q and Z.

(Continued)

#### Follow My Example 19-5

Unit selling price of E:  $[(\$160 \times 0.75) + (\$100 \times 0.25)] = \$145$ Unit variable cost of E:  $[(\$100 \times 0.75) + (\$80 \times 0.25)] = 95$ Unit contribution margin of E: \$50

Break-Even Sales (units) for  $E = $180,000 \div $50 = 3,600$  units

Break-Even Sales (units) for Q = 3,600 units of E  $\times$  75% = 2,700 units of Product Q Break-Even Sales (units) for Z = 3,600 units of E  $\times$  25% = 900 units of Product Z

Practice Exercises: PE 19-5A, PE 19-5B

## **Operating Leverage**

The relationship between a company's contribution margin and income from operations is measured by **operating leverage**. A company's operating leverage is computed as follows:

$$Operating \ Leverage = \frac{Contribution \ Margin}{Income \ from \ Operations}$$

The difference between contribution margin and income from operations is fixed costs. Thus, companies with high fixed costs will normally have high operating leverage. Examples of such companies include airline and automotive companies, like Ford Motor Company. Low operating leverage is normal for companies that are labor intensive, such as professional service companies, which have low fixed costs.

To illustrate operating leverage, assume the following data for Jones Inc. and Wilson Inc.:

	Jones Inc.	Wilson Inc.
Sales	\$400,000	\$400,000
Variable costs	300,000	300,000
Contribution margin	\$100,000	\$100,000
Fixed costs	80,000	50,000
Income from operations	\$ 20,000	\$ 50,000

As shown, Jones and Wilson have the same sales, the same variable costs, and the same contribution margin. However, Jones has larger fixed costs than Wilson and, thus, a higher operating leverage. The operating leverage for each company is computed as follows:

Jones Inc.

Operating Leverage = 
$$\frac{\text{Contribution Margin}}{\text{Income from Operations}} = \frac{\$100,000}{\$20,000} = 5$$

Wilson Inc.

Operating Leverage = 
$$\frac{\text{Contribution Margin}}{\text{Income from Operations}} = \frac{\$100,000}{\$50,000} = 2$$

Operating leverage can be used to measure the impact of changes in sales on income from operations. Using operating leverage, the effect of changes in sales on income from operations is computed as follows:

To illustrate, assume that sales increased by 10%, or 40,000 ( $400,000 \times 10\%$ ), for Jones and Wilson. The percent increase in income from operations for Jones and Wilson is computed as follows:



Jones Inc.

$$\frac{\text{Percent Change in}}{\text{Income from Operations}} = \frac{\text{Percent Change in Sales}}{\text{Sales}} \times \frac{\text{Operating Leverage}}{\text{Leverage}}$$

$$= 10\% \times 5 = 50\%$$
Wilson Inc.
$$\frac{\text{Percent Change in Income from Operations}}{\text{Sales}} = \frac{\text{Percent Change in Sales}}{\text{Sales}} \times \frac{\text{Operating Leverage}}{\text{Leverage}}$$

$$= 10\% \times 2 = 20\%$$

As shown, Jones's income from operations increases by 50%, while Wilson's income from operations increases by only 20%. The validity of this analysis is shown in the following income statements for Jones and Wilson based on the 10% increase in sales:

	Jones Inc.	Wilson Inc.
Sales	\$440,000	\$440,000
Variable costs	330,000	330,000
Contribution margin	\$110,000	\$110,000
Fixed costs	80,000	50,000
Income from operations	\$ 30,000	\$ 60,000

The preceding income statements indicate that Jones's income from operations increased from \$20,000 to \$30,000, a 50% increase ( $$10,000 \div $20,000$ ). In contrast, Wilson's income from operations increased from \$50,000 to \$60,000, a 20% increase ( $$10,000 \div $50,000$ ).

Because even a small increase in sales will generate a large percentage increase in income from operations, Jones might consider ways to increase sales. Such actions could include special advertising or sales promotions. In contrast, Wilson might consider ways to increase operating leverage by reducing variable costs.

The impact of a change in sales on income from operations for companies with high and low operating leverage is summarized in Exhibit 20.

Operating Leverage	Percentage Impact on Income from Operations from a Change in Sales
High	Large
Low	Small

#### **EXHIBIT 20**

Effect of Operating Leverage on Income from Operations

## Example Exercise 19-6 Operating Leverage



Tucker Company reports the following data:

 Sales
 \$750,000

 Variable costs
 500,000

 Contribution margin
 \$250,000

 Fixed costs
 187,500

 Income from operations
 \$ 62,500

Determine Tucker Company's operating leverage.

## Follow My Example 19-6

Operating Leverage = 
$$\frac{\text{Contribution Margin}}{\text{Income from Operations}} = \frac{\$250,000}{\$62,500} = 4.0$$

Practice Exercises: PE 19-6A, PE 19-6B

## **Margin of Safety**

The margin of safety indicates the possible decrease in sales that may occur before an operating loss results. Thus, if the margin of safety is low, even a small decline in sales revenue may result in an operating loss.

The margin of safety may be expressed in the following ways:

- Dollars of sales
- Units of sales
- · Percent of current sales

To illustrate, assume the following data:

Sales	\$250,000
Sales at the break-even point	200,000
Unit selling price	25

The margin of safety in dollars of sales is \$50,000 (\$250,000 - \$200,000). The margin of safety in units is 2,000 units ( $$50,000 \div $25$ ). The margin of safety expressed as a percent of current sales is 20%, computed as follows:

Margin of Safety = 
$$\frac{\text{Sales - Sales at Break-Even Point}}{\text{Sales}}$$
$$= \frac{\$250,000 - \$200,000}{\$250,000} = \frac{\$50,000}{\$250,000} = 20\%$$

Therefore, the current sales may decline \$50,000, 2,000 units, or 20% before an operating loss occurs.

## Example Exercise 19-7 Margin of Safety



Rachel Company has sales of \$400,000, and the break-even point in sales dollars is \$300,000. Determine the company's margin of safety as a percent of current sales.

## Follow My Example 19-7

Margin of Safety = 
$$\frac{\text{Sales - Sales at Break-Even Point}}{\text{Sales}} = \frac{\$400,000 - \$300,000}{\$400,000} = \frac{\$100,000}{\$400,000} = 25\%$$

Practice Exercises: PE 19-7A, PE 19-7B

## APPENDIX

## **Variable Costing**

The cost of manufactured products consists of direct materials, direct labor, and factory overhead. The reporting of all these costs in financial statements is called **absorption costing**. Absorption costing is required under generally accepted accounting principles for financial statements distributed to external users. However, alternative reports may be prepared for decision-making purposes by managers and other internal users. One such alternative reporting is *variable costing* or *direct costing*.

In *variable costing*, the cost of goods manufactured is composed only of variable costs. Thus, the cost of goods manufactured consists of direct materials, direct labor, and *variable* factory overhead.

In a variable costing income statement, *fixed* factory overhead costs do not become a part of the cost of goods manufactured. Instead, fixed factory overhead costs are treated as a period expense. The differences between absorption and variable cost of goods manufactured is summarized in Exhibit 21.

Cost of Goods Manufactured			
Absorption Costing	Variable Costing		
Direct materials	Direct materials		
Direct labor	Direct labor		
Variable factory overhead	Variable factory overhead		
Fixed factory overhead			

**EXHIBIT 21** 

Absorption Versus Variable Cost of Goods Manufactured

The form of a variable costing income statement is as follows:

Sales		\$XXX
Variable cost of goods sold		XXX
Manufacturing margin		\$XXX
Variable selling and administrative expenses		XXX
Contribution margin		\$XXX
Fixed costs:		
Fixed manufacturing costs	\$XXX	
Fixed selling and administrative expenses	XXX	XXX
Income from operations		\$XXX

Manufacturing margin is the excess of sales over variable cost of goods sold.

Manufacturing Margin = Sales - Variable Cost of Goods Sold

Variable cost of goods sold consists of direct materials, direct labor, and variable factory overhead for the units sold. *Contribution margin* is the excess of manufacturing margin over variable selling and administrative expenses.

Contribution Margin = Manufacturing Margin – Variable Selling and Administrative Expenses

Subtracting fixed costs from contribution margin yields income from operations.

Income from Operations = Contribution Margin – Fixed Costs

The variable costing income statement facilitates managerial decision making because manufacturing margin and contribution margin are reported directly. As illustrated in this chapter, contribution margin is used in break-even analysis and other analyses.

To illustrate the variable costing income statement, assume that Martinez Co. manufactures 15,000 units, which are sold at a price of \$50. The related costs and expenses for Martinez are as follows:

		Number	Unit
	Total Cost	of Units	Cost
Manufacturing costs:			
Variable	\$375,000	15,000	\$25
Fixed	150,000	15,000	_10
Total	\$525,000		10 \$35
Selling and administrative expenses:			
Variable (\$5 per unit sold)	\$ 75,000		
Fixed	50,000		
Total	\$125,000		

Exhibit 22 shows the variable costing income statement prepared for Martinez. The computations are shown in parentheses.

#### EXHIBIT 22

Variable Costing Income Statement

Sales (15,000 × \$50)		\$750,000
Variable cost of goods sold (15,000 × \$25)		375,000
Manufacturing margin		\$375,000
Variable selling and administrative expenses (15,000 $\times$ \$5)		75,000
Contribution margin		\$300,000
Fixed costs:		
Fixed manufacturing costs	\$150,000	
Fixed selling and administrative expenses	50,000	200,000
Income from operations		\$100,000

Exhibit 23 illustrates the absorption costing income statement prepared for Martinez. The absorption costing income statement does not distinguish between variable and fixed costs. All manufacturing costs are included in the cost of goods sold. Deducting the cost of goods sold from sales yields the *gross profit*. Deducting the selling and administrative expenses from gross profit yields the *income from operations*.

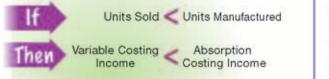
#### **EXHIBIT 23**

Absorption Costing Income Statement

Sales (15,000 × \$50)	\$750,000 _525,000 \$225,000 125,000
Income from operations	\$100,000

The relationship between variable and absorption costing *income from operations* is summarized in Exhibit 24.

## **EXHIBIT 24** Relationship Between Variable and Absorption Costing Income





In Exhibits 22 and 23, Martinez manufactured and sold 15,000 units. Thus, the variable and absorption costing income statements reported the same income from operations of \$100,000. However, assume that only 12,000 units of the 15,000 units Martinez manufactured were sold. Exhibit 25 shows the related variable and absorption costing income statements.

Exhibit 25 shows a \$30,000 (\$70,000 – \$40,000) difference in income from operations. This difference is due to the fixed manufacturing costs. All of the \$150,000 of fixed manufacturing costs is included as a period expense in the variable costing statement. However, the 3,000 units of ending inventory in the absorption costing statement include \$30,000 (3,000 units × \$10) of fixed manufacturing costs. By being included in inventory, this \$30,000 is thus excluded from the current cost of goods sold. Thus, the absorption costing income from operations is \$30,000 higher than the income from operations for variable costing.

A similar analysis could be used to illustrate that income from operations under variable costing is greater than income from operations under absorption costing when the units manufactured are less than the units sold.

Under absorption costing, increases or decreases in income from operations can result from changes in inventory levels. For example, for Martinez, a 3,000 increase in ending inventory created a \$30,000 increase in income from operations under absorption

Variable Costing Income Statement		
Sales (12,000 × \$50)		\$600,000
Variable cost of goods sold:		
Variable cost of goods manufactured (15,000 $\times$ \$25)	\$375,000	
Less ending inventory (3,000 × \$25)	75,000	
Variable cost of goods sold		300,000
Manufacturing margin		\$300,000
Variable selling and administrative expenses (12,000 $\times$ \$5)		60,000
Contribution margin		\$240,000
Fixed costs:		
Fixed manufacturing costs	\$150,000	
Fixed selling and administrative expenses	50,000	200,000
Income from operations		\$ 40,000
Absorption Costing Income Statement		
Sales (12,000 × \$50)		\$600,000
Cost of goods sold:		
Cost of goods manufactured (15,000 × \$35)	\$525,000	
Less ending inventory (3,000 $\times$ \$35)	105,000	
Cost of goods sold		420,000
Gross profit		\$180,000
Selling and administrative expenses [ $(12,000 \times \$5) + \$50,000$ ]		110,000
Income from operations		\$ 70,000
Income from operations		\$ 70,000

#### **EXHIBIT 25**

Units Manufactured Exceed Units Sold

costing. Such increases (decreases) could be misinterpreted by managers using absorption costing as operating efficiencies (inefficiencies). This is one of the reasons that variable costing is often used by managers for cost control, product pricing, and production planning. Such uses of variable costing are discussed in advanced accounting texts.

# At a Glance 19



#### Classify costs as variable costs, fixed costs, or mixed costs.

**Key Points** Variable costs vary in proportion to changes in the level of activity. Fixed costs remain the same in total dollar amount as the level of activity changes. Mixed costs are comprised of both fixed and variable costs.

Learning Outcomes	Example Exercises	Practice Exercises
Describe variable costs.		
Describe fixed costs.		
Describe mixed costs.		
• Separate mixed costs, using the high-low method.	EE19-1	PE19-1A, 19-1B



#### Compute the contribution margin, the contribution margin ratio, and the unit contribution margin.

**Key Points** Contribution margin is the excess of sales revenue over variable costs and can be expressed as a ratio (contribution margin ratio) or a dollar amount (unit contribution margin).

Learning Outcomes	Example Exercises	Practice Exercises
Describe the contribution margin.		
• Compute the contribution margin ratio.	EE19-2	PE19-2A, 19-2B
Compute the unit contribution margin.	EE19-2	PE19-2A, 19-2B



#### Determine the break-even point and sales necessary to achieve a target profit.

**Key Points** The break-even point is the point at which a business's revenues exactly equal costs. The mathematical approach to cost-volume-profit analysis uses the unit contribution margin concept and mathematical equations to determine the break-even point and the volume necessary to achieve a target profit.

Learning Outcomes	Example Exercises	Practice Exercises
• Compute the break-even point in units.	EE19-3	PE19-3A, 19-3B
• Describe how changes in fixed costs affect the break-even point.		
• Describe how changes in unit variable costs affect the break-even point.		
• Describe how a change in the unit selling price affects the break-even point.	EE19-3	PE19-3A, 19-3B
• Modify the break-even equation to compute the unit sales required to earn a target profit.	EE19-4	PE19-4A, 19-4B



## Using a cost-volume-profit chart and a profit-volume chart, determine the break-even point and sales necessary to achieve a target profit.

**Key Points** Graphical methods can be used to determine the break-even point and the volume necessary to achieve a target profit. A cost-volume-profit chart focuses on the relationship among costs, sales, and operating profit or loss. The profit-volume chart focuses on profits rather than on revenues and costs.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe how to construct a cost-volume-profit chart.		
<ul> <li>Determine the break-even point, using a cost-volume- profit chart.</li> </ul>		
• Describe how to construct a profit-volume chart.		
<ul> <li>Determine the break-even point, using a profit-volume chart.</li> </ul>		
• Describe factors affecting the reliability of cost-volume-profit analysis.		



Compute the break-even point for a company selling more than one product, the operating leverage, and the margin of safety.

**Key Points** Cost-volume-profit relationships can be used for analyzing (1) sales mix, (2) operating leverage, and (3) margin of safety.

Learning Outcomes	Example Exercises	Practice Exercises
Compute the break-even point for a mix of products.	EE19-5	PE19-5A, 19-5B
Compute operating leverage.	EE19-6	PE19-6A, 19-6B
Compute the margin of safety.	EE19-7	PE19-7A, 19-7B

## **Key Terms**

absorption costing (908) activity bases (drivers) (884) break-even point (893) contribution margin (890) contribution margin ratio (891) cost behavior (884) cost-volume-profit analysis (890) cost-volume-profit chart (899) fixed costs (886) high-low method (888) margin of safety (908) mixed costs (886) operating leverage (906) profit-volume chart (900) relevant range (884) sales mix (904) unit contribution margin (892) variable costing (890) variable costs (885)

## **Illustrative Problem**

Wyatt Inc. expects to maintain the same inventories at the end of the year as at the beginning of the year. The estimated fixed costs for the year are \$288,000, and the estimated variable costs per unit are \$14. It is expected that 60,000 units will be sold at a price of \$20 per unit. Maximum sales within the relevant range are 70,000 units.

#### **Instructions**

- 1. What is (a) the contribution margin ratio and (b) the unit contribution margin?
- 2. Determine the break-even point in units.
- 3. Construct a cost-volume-profit chart, indicating the break-even point.
- 4. Construct a profit-volume chart, indicating the break-even point.
- 5. What is the margin of safety?

#### Solution

1. a. Contribution Margin Ratio = 
$$\frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}}$$
 
$$= \frac{(60,000 \text{ units} \times \$20) - (60,000 \text{ units} \times \$14)}{(60,000 \text{ units} \times \$20)}$$

$$= \frac{\$1,200,000 - \$840,000}{\$1,200,000} = \frac{\$360,000}{\$1,200,000}$$
$$= 30\%$$

b. Unit Contribution Margin = Unit Selling Price – Unit Variable Costs = \$20 - \$14 = \$6

2. Break-Even Sales (units) = 
$$\frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}}$$

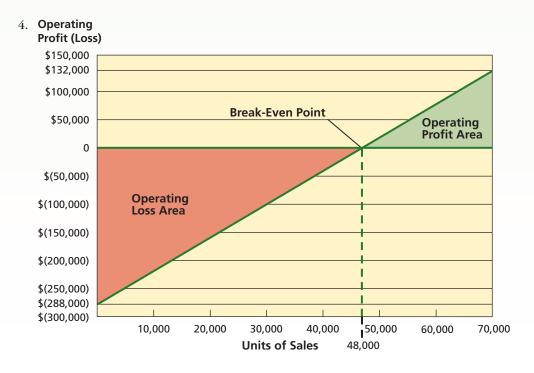
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$$=\frac{$288,000}{$6}$$
 = 48,000 units



**Units of Sales** 

48,000



5. Margin of safety:

Expected sales (60,000 units 
$$\times$$
 \$20) \$1,200,000 Break-even point (48,000 units  $\times$  \$20) 960,000 \$\frac{960,000}{\$240,000}\$ or

Margin of Safety (units) = \frac{Margin of Safety (dollars)}{Unit Selling Price} \text{ or } 12,000 units (\$240,000 \div \$20) \text{ or } \text{ or } \text{ Sales} - Sales at Break-Even Point } \text{ Sales} \text{ Sales} \text{ Sales}

\$1,200,000

## **Discussion Questions**

- 1. Describe how total variable costs and unit variable costs behave with changes in the level of activity.
- 2. Which of the following costs would be classified as variable and which would be classified as fixed, if units produced is the activity base?
  - a. Direct materials costs
  - b. Electricity costs of \$0.35 per kilowatt-hour
- 3. Describe how total fixed costs and unit fixed costs behave with changes in the level of activity.
- 4. In applying the high-low method of cost estimation to mixed costs, how is the total fixed cost estimated?
- 5. If fixed costs increase, what would be the impact on the (a) contribution margin? (b) income from operations?

- 6. An examination of the accounting records of Clowney Company disclosed a high contribution margin ratio and production at a level below maximum capacity. Based on this information, suggest a likely means of improving income from operations. Explain.
- If the unit cost of direct materials is decreased, what effect will this change have on the break-even point?
- 8. Both Austin Company and Hill Company had the same unit sales, total costs, and income from operations for the current fiscal year; yet, Austin Company had a lower break-even point than Hill Company. Explain the reason for this difference in break-even points.
- 9. How does the sales mix affect the calculation of the break-even point?
- 10. What does operating leverage measure, and how is it computed?

## **Practice Exercises**

EE 10_1 n 880

#### PE 19-1A High-low method

OBJ. 1

The manufacturing costs of Lightfoot Industries for three months of the year follow:

ow .		Total Costs	Units Produced
iow	January	\$640,000	30,000 units
	February	900,000	40,000
	March	350.000	12.500

Using the high-low method, determine (a) the variable cost per unit and (b) the total fixed cost.



#### **EE 19-1** *p. 889*

#### PE 19-1B High-low method

OBJ. 1



The manufacturing costs of Carrefour Enterprises for the first three months of the year follow:

	<b>Total Costs</b>	<b>Units Produced</b>
June	\$300,000	2,700 units
July	440,000	5,500
August	325,000	3,500

Using the high-low method, determine (a) the variable cost per unit and (b) the total fixed cost.

#### **EE 19-2** *p. 893*

#### PE 19-2A Contribution margin

OBJ. 2



Michigan Company sells 10,000 units at \$100 per unit. Variable costs are \$75 per unit, and fixed costs are \$125,000. Determine (a) the contribution margin ratio, (b) the unit contribution margin, and (c) income from operations.

#### **EE 19-2** *p. 893*

#### PE 19-2B Contribution margin

OBJ. 2



Weidner Company sells 22,000 units at \$30 per unit. Variable costs are \$24 per unit, and fixed costs are \$40,000. Determine (a) the contribution margin ratio, (b) the unit contribution margin, and (c) income from operations.

#### **EE 19-3** p. 897

#### PE 19-3A Break-even point

OBJ. 3



Santana sells a product for \$115 per unit. The variable cost is \$75 per unit, while fixed costs are \$65,000. Determine (a) the break-even point in sales units and (b) the break-even point if the selling price were increased to \$125 per unit.

#### **EE 19-3** *p. 897*

#### PE 19-3B Break-even point

OBJ. 3



Elrod Inc. sells a product for \$75 per unit. The variable cost is \$45 per unit, while fixed costs are \$48,000. Determine (a) the break-even point in sales units and (b) the break-even point if the selling price were increased to \$95 per unit.

#### **EE 19-4** *p. 898*

#### PE 19-4A Target profit

OBJ. 3



Versa Inc. sells a product for \$100 per unit. The variable cost is \$75 per unit, and fixed costs are \$45,000. Determine (a) the break-even point in sales units and (b) the break-even point in sales units if the company desires a target profit of \$25,000.

#### **EE 19-4** *p. 898*

#### PE 19-4B Target profit

OBJ. 3



Scrushy Company sells a product for \$150 per unit. The variable cost is \$110 per unit, and fixed costs are \$200,000. Determine (a) the break-even point in sales units and (b) the break-even point in sales units if the company desires a target profit of \$50,000.

#### **EE 19-5** *p. 905*

#### PE 19-5A Sales mix and break-even analysis

OBJ. 5



Wide Open Industries Inc. has fixed costs of \$475,000. The unit selling price, variable cost per unit, and contribution margin per unit for the company's two products follow:

Product	Selling Price	Variable Cost per Unit	Contribution Margin per Unit
AA	\$145	\$105	\$40
BB	110	75	35

The sales mix for products AA and BB is 60% and 40%, respectively. Determine the breakeven point in units of AA and BB.

#### **EE 19-5** *p. 905*

#### PE 19-5B Sales mix and break-even analysis

OBJ. 5



Einhorn Company has fixed costs of \$105,000. The unit selling price, variable cost per unit, and contribution margin per unit for the company's two products follow:

Product	Selling Price	Variable Cost per Unit	Contribution Margin per Unit
QQ	\$50	\$35	\$15
ZZ	60	30	30

The sales mix for products QQ and ZZ is 40% and 60%, respectively. Determine the break-even point in units of QQ and ZZ.

#### **EE 19-6** p. 907

#### **PE 19-6A** Operating leverage

OBJ. 5



SungSam Enterprises reports the following data:

Sales	\$340,000
Variable costs	180,000
Contribution margin	\$160,000
Fixed costs	80,000
Income from operations	\$ 80,000

Determine SungSam Enterprises's operating leverage.

#### **EE 19-6** p. 907

#### PE 19-6B Operating leverage

OBJ. 5



Westminster Co. reports the following data:

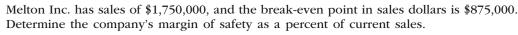
Sales	\$875,000
Variable costs	425,000
Contribution margin	\$450,000
Fixed costs	150,000
Income from operations	\$300,000

Determine Westminster Co.'s operating leverage.

#### **EE 19-7** *p. 908*

#### PE 19-7A Margin of safety

OBJ. 5





ME HOW

**EE 19-7** *p. 908* 

#### PE 19-7B Margin of safety

OBJ. 5

Junck Company has sales of \$550,000, and the break-even point in sales dollars is \$385,000. Determine the company's margin of safety as a percent of current sales.

## **Exercises**

#### EX 19-1 Classify costs

OBJ. 1

Following is a list of various costs incurred in producing replacement automobile parts. With respect to the production and sale of these auto parts, classify each cost as either variable, fixed, or mixed.

- 1. Oil used in manufacturing equipment
- 2. Plastic
- 3. Property taxes, \$165,000 per year on factory building and equipment
- 4. Salary of plant manager
- 5. Cost of labor for hourly workers
- 6. Packaging
- 7. Factory cleaning costs, \$6,000 per month
- 8. Metal

(Continued)

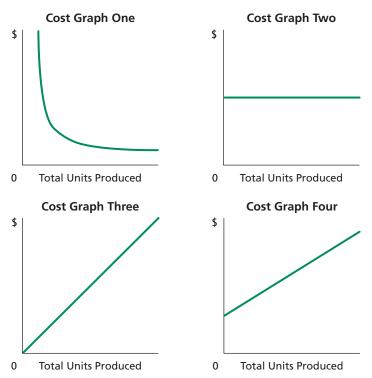
918

- 10. Property insurance premiums, \$3,600 per month plus \$0.01 for each dollar of property over \$1,200,000
- 11. Straight-line depreciation on the production equipment
- 12. Hourly wages of machine operators
- 13. Electricity costs, \$0.20 per kilowatt-hour
- 14. Computer chip (purchased from a vendor)
- 15. Pension cost, \$1.00 per employee hour on the job

#### EX 19-2 Identify cost graphs

OBJ. 1

The following cost graphs illustrate various types of cost behavior:



For each of the following costs, identify the cost graph that best illustrates its cost behavior as the number of units produced increases:

- a. Total direct materials cost
- b. Electricity costs of \$1,000 per month plus \$0.10 per kilowatt-hour
- c. Per-unit cost of straight-line depreciation on factory equipment
- d. Salary of quality control supervisor, \$20,000 per month
- e. Per-unit direct labor cost

#### **EX 19-3** Identify activity bases

OBJ. 1

For a major university, match each cost in the following table with the activity base most appropriate to it. An activity base may be used more than once or not used at all.

#### Cost:

- 1. Financial aid office salaries
- 2. Office supplies
- 3. Instructor salaries
- 4. Housing personnel wages
- 5. Student records office salaries
- 6. Admissions office salaries

#### **Activity Base:**

- a. Number of enrollment applications
- b. Number of students
- c. Student credit hours
- d. Number of enrolled students and alumni
- e. Number of financial aid applications
- f. Number of students living on campus

#### EX 19-4 Identify activity bases

OBJ. 1

From the following list of activity bases for an automobile dealership, select the base that would be most appropriate for each of these costs: (1) preparation costs (cleaning, oil, and gasoline costs) for each car received, (2) salespersons' commission of 5% of the sales price for each car sold, and (3) administrative costs for ordering cars.

- a. Number of cars sold
- b. Dollar amount of cars ordered
- c. Number of cars ordered
- d. Number of cars on hand
- e. Number of cars received
- f. Dollar amount of cars sold
- g. Dollar amount of cars received
- h. Dollar amount of cars on hand

#### EX 19-5 Identify fixed and variable costs

OBJ. 1

Intuit Inc. develops and sells software products for the personal finance market, including popular titles such as Quickbooks® and TurboTax®. Classify each of the following costs and expenses for this company as either variable or fixed to the number of units produced and sold:

- a. Packaging costs
- b. Sales commissions
- c. Property taxes on general offices
- d. Shipping expenses
- e. Straight-line depreciation of computer equipment
- f. President's salary
- g. Salaries of software developers
- h. Salaries of human resources personnel
- i. Wages of telephone order assistants
- i. CDs
- k. Users' guides

#### EX 19-6 Relevant range and fixed and variable costs

OBJ. 1

Quigley Inc. manufactures memory chips for electronic toys within a relevant range of 200,000 to 600,000 memory chips per year. Within this range, the following partially completed manufacturing cost schedule has been prepared:

Components produced	200,000	400,000	600,000
Total costs:			
Total variable costs	\$ 250,000	(d)	(j)
Total fixed costs	600,000	(e)	(k)
Total costs	\$850,000	(f)	(I)
Cost per unit:			
Variable cost per unit	(a)	(g)	(m)
Fixed cost per unit	(b)	(h)	(n)
Total cost per unit	(c)	(i)	(o)

Complete the cost schedule, identifying each cost by the appropriate letter (a) through (o).

#### ✓ a. \$24.00 per unit

#### EX 19-7 High-low method

OBJ. 1

Diamond Inc. has decided to use the high-low method to estimate the total cost and the fixed and variable cost components of the total cost. The data for various levels of production are as follows:

Units Produced	Total Costs
12,000	\$424,000
15,000	496,000
21,000	640,000

(Continued)





✓ a. \$1.25



- a. Determine the variable cost per unit and the total fixed cost.
- b. Based on part (a), estimate the total cost for 17,000 units of production.

#### EX 19-8 High-low method for a service company

OBJ, 1

Boston Railroad decided to use the high-low method and operating data from the past six months to estimate the fixed and variable components of transportation costs. The activity base used by Boston Railroad is a measure of railroad operating activity, termed "gross-ton miles," which is the total number of tons multiplied by the miles moved.

	<b>Transportation Costs</b>	<b>Gross-Ton Miles</b>
January	\$1,776,000	560,000
February	2,700,000	1,000,000
March	1,650,000	500,000
April	1,860,000	600,000
May	1,440,000	400,000
June	1,566,000	460,000

Determine the variable cost per gross-ton mile and the total fixed cost.

#### EX 19-9 Contribution margin ratio

OBJ. 2

- a. Segar Company budgets sales of \$3,200,000, fixed costs of \$700,000, and variable costs of \$2,240,000. What is the contribution margin ratio for Segar Company?
- b. If the contribution margin ratio for Domino Company is 35%, sales were \$2,100,000, and fixed costs were \$400,000, what was the income from operations?

#### **EX 19-10** Contribution margin and contribution margin ratio

OBJ. 2

For a recent year, McDonald's company-owned restaurants had the following sales and expenses (in millions):

Sales	\$18,602.5
Food and packaging	\$ 6,318.2
Payroll	4,710.3
Occupancy (rent, depreciation, etc.)	4,195.2
General, selling, and administrative expenses	2,445.2
	17,668.9
Income from operations	\$ 933.6

Assume that the variable costs consist of food and packaging, payroll, and 40% of the general, selling, and administrative expenses.

- What is McDonald's contribution margin? Round to the nearest tenth of a million (one decimal place).
- b. What is McDonald's contribution margin ratio? Round to one decimal place.
- c. How much would income from operations increase if same-store sales increased by \$900 million for the coming year, with no change in the contribution margin ratio or fixed costs? Round your answer to the nearest tenth of a million (one decimal place).

#### EX 19-11 Break-even sales and sales to realize income from operations

OBJ. 3

For the current year ended March 31, Benatar Company expects fixed costs of \$1,250,000, a unit variable cost of \$140, and a unit selling price of \$100.

- a. Compute the anticipated break-even sales (units).
- b. Compute the sales (units) required to realize income from operations of \$150,000.

✓ Fixed cost, \$600,000





✓ a. 30%



MF HOW

✓ b. 35.5%





✓ b. 35,000 units



#### EX 19-12 Break-even sales

OBJ. 3

✓ a. 150,331,823 barrels
Anheuser-Busch InBev Companies, Inc., reported the following operating information for a recent year (in millions):

Sales	\$39,758
Cost of goods sold	\$16,447
Selling, general and administration	10,578
	\$27,025
Income from operations	\$12,733*

*Before special items

In addition, assume that Anheuser-Busch InBev sold 320 million barrels of beer during the year. Assume that variable costs were 70% of the cost of goods sold and 40% of selling, general, and administration expenses. Assume that the remaining costs are fixed. For the following year, assume that Anheuser-Busch InBev expects pricing, variable costs per barrel, and fixed costs to remain constant, except that new distribution and general office facilities are expected to increase fixed costs by \$400 million.

- a. Compute the break-even number of barrels for the current year. *Note:* For the selling price per barrel and variable costs per barrel, round to the nearest cent. Also, round the break-even to the nearest barrel.
- b. Compute the anticipated break-even number of barrels for the following year.

#### EX 19-13 Break-even sales

OBJ. 3

Currently, the unit selling price of a product is \$160, the unit variable cost is \$120, and the total fixed costs are \$725,000. A proposal is being evaluated to increase the unit selling price to \$170.

- a. Compute the current break-even sales (units).
- b. Compute the anticipated break-even sales (units), assuming that the unit selling price is increased and all costs remain constant.

#### EX 19-14 Break-even analysis

OBJ. 3

The Junior League of Yadkinville, California, collected recipes from members and published a cookbook entitled *Food for Everyone*. The book will sell for \$18 per copy. The chairwoman of the cookbook development committee estimated that the club needed to sell 2,000 books to break even on its \$4,000 investment. What is the variable cost per unit assumed in the Junior League's analysis?

#### EX 19-15 Break-even analysis

OBJ. 3

Media outlets such as ESPN and Fox Sports often have Web sites that provide in-depth coverage of news and events. Portions of these Web sites are restricted to members who pay a monthly subscription to gain access to exclusive news and commentary. These Web sites typically offer a free trial period to introduce viewers to the Web site. Assume that during a recent fiscal year, ESPN.com spent \$4,200,000 on a promotional campaign for the ESPN.com Web site that offered two free months of service for new subscribers. In addition, assume the following information:

Number of months an average new customer stays with the service	
(including the two free months)	14 months
Revenue per month per customer subscription	\$10.00
Variable cost per month per customer subscription	\$5.00

Determine the number of new customer accounts needed to break even on the cost of the promotional campaign. In forming your answer, (1) treat the cost of the promotional campaign as a fixed cost, and (2) treat the revenue less variable cost per account for the subscription period as the unit contribution margin.

✓ a. 18,125 units











#### EX 19-16 Break-even analysis for a service company

OBJ. 3

Sprint Nextel is one of the largest digital wireless service providers in the United States. In a recent year, it had approximately 32.5 million direct subscribers (accounts) that generated revenue of \$35,345 million. Costs and expenses for the year were as follows (in millions):

Cost of revenue	\$20,841
Selling, general, and administrative expenses	9,765
Depreciation	2,239

Assume that 70% of the cost of revenue and 30% of the selling, general, and administrative expenses are variable to the number of direct subscribers (accounts).

- a. What is Sprint Nextel's break-even number of accounts, using the data and assumptions given? Round units (accounts) and per-account amounts to one decimal place.
- b. How much revenue per account would be sufficient for Sprint Nextel to break even if the number of accounts remained constant?

#### EX 19-17 Cost-volume-profit chart

OBJ. 4

For the coming year, Loudermilk Inc. anticipates fixed costs of \$600,000, a unit variable cost of \$75, and a unit selling price of \$125. The maximum sales within the relevant range are \$2,500,000.

- a. Construct a cost-volume-profit chart.
- b. Estimate the break-even sales (dollars) by using the cost-volume-profit chart constructed in part (a).
- c. What is the main advantage of presenting the cost-volume-profit analysis in graphic form rather than equation form?

#### EX 19-18 Profit-volume chart

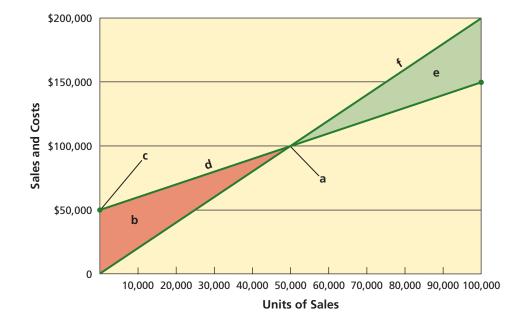
OBJ. 4

Using the data for Loudermilk Inc. in Exercise 19-17, (a) determine the maximum possible operating loss, (b) compute the maximum possible operating profit, (c) construct a profit-volume chart, and (d) estimate the break-even sales (units) by using the profit-volume chart constructed in part (c).

#### EX 19-19 Break-even chart

OBJ. 4

Name the following chart, and identify the items represented by the letters (a) through (f):



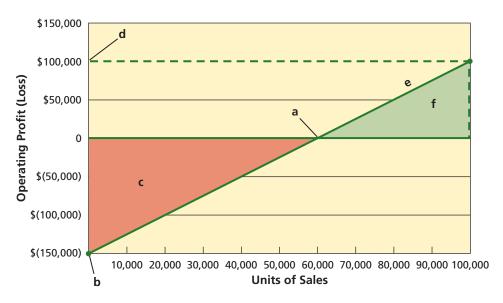
√ b. \$1,500,000

**✓** b. \$400,000

#### EX 19-20 Break-even chart

OBJ. 4

Name the following chart, and identify the items represented by the letters (a) through (f):



#### EX 19-21 Sales mix and break-even sales

OBJ. 5

Dragon Sports Inc. manufactures and sells two products, baseball bats and baseball gloves. The fixed costs are \$620,000, and the sales mix is 40% bats and 60% gloves. The unit selling price and the unit variable cost for each product are as follows:

Products	Unit Selling Price	<b>Unit Variable Cost</b>
Bats	\$ 90	\$50
Gloves	105	65

- a. Compute the break-even sales (units) for the overall product, E.
- b. How many units of each product, baseball bats and baseball gloves, would be sold at the break-even point?

#### EX 19-22 Break-even sales and sales mix for a service company

OBJ. 5

Zero Turbulence Airline provides air transportation services between Los Angeles, California, and Kona, Hawaii. A single Los Angeles to Kona round-trip flight has the following operating statistics:

Fuel	\$7,000
Flight crew salaries	3,200
Airplane depreciation	3,480
Variable cost per passenger—business class	140
Variable cost per passenger—economy class	120
Round-trip ticket price—business class	800
Round-trip ticket price—economy class	300

It is assumed that the fuel, crew salaries, and airplane depreciation are fixed, regardless of the number of seats sold for the round-trip flight.

- a. Compute the break-even number of seats sold on a single round-trip flight for the overall product, E. Assume that the overall product mix is 10% business class and 90% economy class tickets.
- b. How many business class and economy class seats would be sold at the break-even point?

✓ a. 15,500 units



✓ a. 60 seats



#### EX 19-23 Margin of safety

OBJ. 5

a. If Canace Company, with a break-even point at \$960,000 of sales, has actual sales of \$1,200,000, what is the margin of safety expressed (1) in dollars and (2) as a percentage of sales?

b. If the margin of safety for Canace Company was 20%, fixed costs were \$1,875,000, and variable costs were 80% of sales, what was the amount of actual sales (dollars)? (*Hint:* Determine the break-even in sales dollars first.)

#### **EX 19-24** Break-even and margin of safety relationships

OBJ. 5

At a recent staff meeting, the management of Boost Technologies Inc. was considering discontinuing the Rocket Man line of electronic games from the product line. The chief financial analyst reported the following current monthly data for the Rocket Man:

Units of sales	420,000
Break-even units	472,500
Margin of safety in units	29,400

For what reason would you question the validity of these data?

#### EX 19-25 Operating leverage

OBJ. 5

Beck Inc. and Bryant Inc. have the following operating data:

	Beck Inc.	Bryant Inc.
Sales	\$1,250,000	\$2,000,000
Variable costs	750,000	1,250,000
Contribution margin	\$ 500,000	\$ 750,000
Fixed costs	400,000	450,000
Income from operations	\$ 100,000	\$ 300,000

- a. Compute the operating leverage for Beck Inc. and Bryant Inc.
- b. How much would income from operations increase for each company if the sales of each increased by 20%?
- c. Why is there a difference in the increase in income from operations for the two companies? Explain.

#### **Appendix**

#### EX 19-26 Items on variable costing income statement

In the following equations, based on the variable costing income statement, identify the items designated by X:

- a. Sales -X = Manufacturing Margin
- b. Manufacturing Margin X = Contribution Margin
- c. Contribution Margin X = Income from Operations

#### **Appendix**

#### EX 19-27 Variable costing income statement

On July 31, 2016, the end of the first month of operations, Rhys Company prepared the following income statement, based on the absorption costing concept:

Sales (96,000 units)		\$4,440,000
Cost of goods sold:		
Cost of goods manufactured	\$3,120,000	
Less ending inventory (24,000 units)	624,000	
Cost of goods sold		2,496,000
Gross profit		\$1,944,000
Selling and administrative expenses		288,000
Income from operations		\$1,656,000

- a. Prepare a variable costing income statement, assuming that the fixed manufacturing costs were \$132,000 and the variable selling and administrative expenses were \$115,200.
- b. Reconcile the absorption costing income from operations of \$1,656,000 with the variable costing income from operations determined in (a).

✓ a. (2) 20%



✓ a. Beck, 5.0

✓ a. Contribution margin, \$1,934,400



#### **Appendix**

#### EX 19-28 Absorption costing income statement

✓ a. Gross profit, \$1,435,600



On June 30, 2016, the end of the first month of operations, Tudor Manufacturing Co. prepared the following income statement, based on the variable costing concept:

Sales (420,000 units)		\$7,450,000
Variable cost of goods sold:		
Variable cost of goods manufactured (500,000 units $\times$ \$14 per unit)	\$7,000,000	
Less ending inventory (80,000 units $\times$ \$14 per unit)	1,120,000	
Variable cost of goods sold		5,880,000
Manufacturing margin		\$1,570,000
Variable selling and administrative expenses		80,000
Contribution margin		\$1,490,000
Fixed costs:		
Fixed manufacturing costs	\$ 160,000	
Fixed selling and administrative expenses	75,000	235,000
Income from operations		\$1,255,000

- a. Prepare an absorption costing income statement.
- b. Reconcile the variable costing income from operations of \$1,255,000 with the absorption costing income from operations determined in (a).

## **Problems: Series A**

#### PR 19-1A Classify costs

OBJ. 1

Seymour Clothing Co. manufactures a variety of clothing types for distribution to several major retail chains. The following costs are incurred in the production and sale of blue jeans:

- a. Shipping boxes used to ship orders
- b. Consulting fee of \$200,000 paid to industry specialist for marketing advice
- c. Straight-line depreciation on sewing machines
- d. Salesperson's salary, \$10,000 plus 2% of the total sales
- e. Fabric
- f. Dye
- g. Thread
- h. Salary of designers
- i. Brass buttons
- j. Legal fees paid to attorneys in defense of the company in a patent infringement suit, \$50,000 plus \$87 per hour
- k. Insurance premiums on property, plant, and equipment, \$70,000 per year plus \$5 per \$30,000 of insured value over \$8,000,000
- 1. Rental costs of warehouse, \$5,000 per month plus \$4 per square foot of storage used
- m. Supplies
- n. Leather for patches identifying the brand on individual pieces of apparel
- o. Rent on plant equipment, \$50,000 per year
- p. Salary of production vice president
- q. Janitorial services, \$2,200 per month
- r. Wages of machine operators
- s. Electricity costs of \$0.10 per kilowatt-hour
- t. Property taxes on property, plant, and equipment

#### **Instructions**

Classify the preceding costs as either fixed, variable, or mixed. Use the following tabular headings and place an X in the appropriate column. Identify each cost by letter in the cost column.

Cost Fixed Cost Variable Cost Mixed Cost

#### PR 19-2A Break-even sales under present and proposed conditions

OBJ. 2, 3

✓ 2. (b) \$50



BeeGee Company, operating at full capacity, sold 150,000 units at a price of \$116 per unit during the current year. Its income statement is as follows:

Sales		\$17,400,000
Cost of goods sold		6,000,000
Gross profit		\$11,400,000
Expenses:		
Selling expenses	\$4,000,000	
Administrative expenses	3,000,000	
Total expenses		7,000,000
Income from operations		\$ 4,400,000

The division of costs between variable and fixed is as follows:

	Variable	Fixed
Cost of goods sold	80%	20%
Selling expenses	75%	25%
Administrative expenses	70%	30%

Management is considering a plant expansion program for the following year that will permit an increase of \$3,625,000 in yearly sales. The expansion will increase fixed costs by \$1,000,000 but will not affect the relationship between sales and variable costs.

#### **Instructions**

- 1. Determine the total variable costs and the total fixed costs for the current year.
- 2. Determine (a) the unit variable cost and (b) the unit contribution margin for the current year.
- 3. Compute the break-even sales (units) for the current year.
- 4. Compute the break-even sales (units) under the proposed program for the following year.
- 5. Determine the amount of sales (units) that would be necessary under the proposed program to realize the \$4,400,000 of income from operations that was earned in the current year.
- 6. Determine the maximum income from operations possible with the expanded plant.
- 7. If the proposal is accepted and sales remain at the current level, what will the income or loss from operations be for the following year?
- 8. Based on the data given, would you recommend accepting the proposal? Explain.

#### PR 19-3A Break-even sales and cost-volume-profit chart

OBJ. 3, 4

For the coming year, Cleves Company anticipates a unit selling price of \$100, a unit variable cost of \$60, and fixed costs of \$480,000.

#### **Instructions**

- 1. Compute the anticipated break-even sales (units).
- 2. Compute the sales (units) required to realize a target profit of \$240,000.
- 3. Construct a cost-volume-profit chart, assuming maximum sales of 20,000 units within the relevant range.
- 4. Determine the probable income (loss) from operations if sales total 16,000 units.

#### PR 19-4A Break-even sales and cost-volume-profit chart

OBJ. 3, 4

Last year, Hever Inc. had sales of \$500,000, based on a unit selling price of \$250. The variable cost per unit was \$175, and fixed costs were \$75,000. The maximum sales within Hever Inc.'s relevant range are 2,500 units. Hever Inc. is considering a proposal to spend an additional \$33,750 on billboard advertising during the current year in an attempt to increase sales and utilize unused capacity.

#### **Instructions**

- 1. Construct a cost-volume-profit chart indicating the break-even sales for last year. Verify your answer, using the break-even equation.
- 2. Using the cost-volume-profit chart prepared in part (1), determine (a) the income from operations for last year and (b) the maximum income from operations that could have been realized during the year. Verify your answers using the mathematical approach to cost-volume-profit analysis.

✓ 1. 12,000 units

✓ 1. 1,000 units

- 3. Construct a cost-volume-profit chart indicating the break-even sales for the current year, assuming that a noncancellable contract is signed for the additional billboard advertising. No changes are expected in the unit selling price or other costs. Verify your answer, using the break-even equation.
- 4. Using the cost-volume-profit chart prepared in part (3), determine (a) the income from operations if sales total 2,000 units and (b) the maximum income from operations that could be realized during the year. Verify your answers using the mathematical approach to cost-volume-profit analysis.

#### PR 19-5A Sales mix and break-even sales

OBJ. 5

✓ 1. 4,030 units Data related

Data related to the expected sales of laptops and tablets for Tech Products Inc. for the current year, which is typical of recent years, are as follows:

Products	Unit Selling Price	<b>Unit Variable Cost</b>	Sales Mix
Laptops	\$1,600	\$800	40%
Tablets	850	350	60%

The estimated fixed costs for the current year are \$2,498,600.

#### **Instructions**

- 1. Determine the estimated units of sales of the overall (total) product, E, necessary to reach the break-even point for the current year.
- 2. Based on the break-even sales (units) in part (1), determine the unit sales of both laptops and tablets for the current year.
- 3. Assume that the sales mix was 50% laptops and 50% tablets. Compare the break-even point with that in part (1). Why is it so different?

## PR 19-6A Contribution margin, break-even sales, cost-volume-profit chart, OBJ. 2, 3, 4, 5 margin of safety, and operating leverage

Wolsey Industries Inc. expects to maintain the same inventories at the end of 2016 as at the beginning of the year. The total of all production costs for the year is therefore assumed to be equal to the cost of goods sold. With this in mind, the various department heads were asked to submit estimates of the costs for their departments during the year. A summary report of these estimates is as follows:

	Estimated Fixed Cost	Estimated Variable Cost (per unit sold)
Production costs:		
Direct materials	_	\$ 46
Direct labor	_	40
Factory overhead	\$200,000	20
Selling expenses:		
Sales salaries and commissions	110,000	8
Advertising	40,000	_
Travel	12,000	_
Miscellaneous selling expense	7,600	1
Administrative expenses:		
Office and officers' salaries	132,000	_
Supplies	10,000	4
Miscellaneous administrative expense	13,400	1
Total	\$525,000	\$120

It is expected that 21,875 units will be sold at a price of \$160 a unit. Maximum sales within the relevant range are 27,000 units.

#### **Instructions**

- 1. Prepare an estimated income statement for 2016.
- 2. What is the expected contribution margin ratio?
- 3. Determine the break-even sales in units and dollars.
- 4. Construct a cost-volume-profit chart indicating the break-even sales.
- 5. What is the expected margin of safety in dollars and as a percentage of sales?
- 6. Determine the operating leverage.

**2**. 25%



## **Problems: Series B**

#### PR 19-1B Classify costs

OBJ. 1

Cromwell Furniture Company manufactures sofas for distribution to several major retail chains. The following costs are incurred in the production and sale of sofas:

- a. Fabric for sofa coverings
- b. Wood for framing the sofas
- Legal fees paid to attorneys in defense of the company in a patent infringement suit, \$25,000 plus \$160 per hour
- d. Salary of production supervisor
- e. Cartons used to ship sofas
- f. Rent on experimental equipment, \$50 for every sofa produced
- g. Straight-line depreciation on factory equipment
- h. Rental costs of warehouse, \$30,000 per month
- i. Property taxes on property, plant, and equipment
- j. Insurance premiums on property, plant, and equipment, \$25,000 per year plus \$25 per \$25,000 of insured value over \$16,000,000
- k. Springs
- 1. Consulting fee of \$120,000 paid to efficiency specialists
- m. Electricity costs of \$0.13 per kilowatt-hour
- n. Salesperson's salary, \$80,000 plus 4% of the selling price of each sofa sold
- o. Foam rubber for cushion fillings
- p. Janitorial supplies, \$2,500 per month
- q. Employer's FICA taxes on controller's salary of \$180,000
- r. Salary of designers
- s. Wages of sewing machine operators
- t. Sewing supplies

#### **Instructions**

Classify the preceding costs as either fixed, variable, or mixed. Use the following tabular headings and place an X in the appropriate column. Identify each cost by letter in the cost column.

#### PR 19-2B Break-even sales under present and proposed conditions

OBJ. 2. 3

Howard Industries Inc., operating at full capacity, sold 64,000 units at a price of \$45 per unit during the current year. Its income statement is as follows:

Sales		\$2,880,000
Cost of goods sold		1,400,000
Gross profit		\$1,480,000
Expenses:		
Selling expenses	\$400,000	
Administrative expenses	387,500	
Total expenses		787,500
Income from operations		\$ 692,500

The division of costs between variable and fixed is as follows:

	Variable	Fixed
Cost of goods sold	75%	25%
Selling expenses	60%	40%
Administrative expenses	80%	20%

√ 3. 29,375 units



Management is considering a plant expansion program for the following year that will permit an increase of \$900,000 in yearly sales. The expansion will increase fixed costs by \$212,500 but will not affect the relationship between sales and variable costs.

#### **Instructions**

- 1. Determine the total fixed costs and the total variable costs for the current year.
- 2. Determine (a) the unit variable cost and (b) the unit contribution margin for the current year.
- 3. Compute the break-even sales (units) for the current year.
- 4. Compute the break-even sales (units) under the proposed program for the following year.
- 5. Determine the amount of sales (units) that would be necessary under the proposed program to realize the \$692,500 of income from operations that was earned in the current year.
- 6. Determine the maximum income from operations possible with the expanded plant.
- 7. If the proposal is accepted and sales remain at the current level, what will the income or loss from operations be for the following year?
- Based on the data given, would you recommend accepting the proposal?
   Explain.

#### PR 19-3B Break-even sales and cost-volume-profit chart

OBJ. 3. 4

✓ 1. 20,000 units

For the coming year, Culpeper Products Inc. anticipates a unit selling price of \$150, a unit variable cost of \$110, and fixed costs of \$800,000.

#### Instructions

- 1. Compute the anticipated break-even sales (units).
- 2. Compute the sales (units) required to realize income from operations of \$300,000.
- 3. Construct a cost-volume-profit chart, assuming maximum sales of 40,000 units within the relevant range.
- 4. Determine the probable income (loss) from operations if sales total 32,000 units.

#### PR 19-4B Break-even sales and cost-volume-profit chart

OBJ. 3, 4

✓ 1. 3,000 units

Last year, Parr Co. had sales of \$900,000, based on a unit selling price of \$200. The variable cost per unit was \$125, and fixed costs were \$225,000. The maximum sales within Parr Co.'s relevant range are 7,500 units. Parr Co. is considering a proposal to spend an additional \$112,500 on billboard advertising during the current year in an attempt to increase sales and utilize unused capacity.

#### **Instructions**

- 1. Construct a cost-volume-profit chart indicating the break-even sales for last year. Verify your answer, using the break-even equation.
- 2. Using the cost-volume-profit chart prepared in part (1), determine (a) the income from operations for last year and (b) the maximum income from operations that could have been realized during the year. Verify your answers arithmetically.
- 3. Construct a cost-volume-profit chart indicating the break-even sales for the current year, assuming that a noncancellable contract is signed for the additional billboard advertising. No changes are expected in the selling price or other costs. Verify your answer, using the break-even equation.
- 4. Using the cost-volume-profit chart prepared in part (3), determine (a) the income from operations if sales total 6,000 units and (b) the maximum income from operations that could be realized during the year. Verify your answers arithmetically.

#### ✓ 1. 4,500 units

#### PR 19-5B Sales mix and break-even sales

OBJ. 5

Data related to the expected sales of two types of frozen pizzas for Norfolk Frozen Foods Inc. for the current year, which is typical of recent years, are as follows:

Products	Unit Selling Price	<b>Unit Variable Cost</b>	Sales Mix	
12" Pizza	\$12	\$3	30%	
16" Pizza	15	4	70%	(Continued)

The estimated fixed costs for the current year are \$46,800.

#### Instructions

- 1. Determine the estimated units of sales of the overall (total) product, E, necessary to reach the break-even point for the current year.
- 2. Based on the break-even sales (units) in part (1), determine the unit sales of both the 12" pizza and 16" pizza for the current year.
- 3. Assume that the sales mix was 50% 12" pizza and 50% 16" pizza. Compare the break-even point with that in part (1). Why is it so different?

#### ✓ 3. 8,000 units



## PR 19-6B Contribution margin, break-even sales, cost-volume-profit chart, OBJ. 2, 3, 4, 5 margin of safety, and operating leverage

Belmain Co. expects to maintain the same inventories at the end of 2016 as at the beginning of the year. The total of all production costs for the year is therefore assumed to be equal to the cost of goods sold. With this in mind, the various department heads were asked to submit estimates of the costs for their departments during the year. A summary report of these estimates is as follows:

	Estimated Fixed Cost	Estimated Variable Cost (per unit sold)
Production costs:		
Direct materials	_	\$50.00
Direct labor	_	30.00
Factory overhead	\$ 350,000	6.00
Sales salaries and commissions	340,000	4.00
Advertising	116,000	_
Travel	4,000	_
Miscellaneous selling expense	2,300	1.00
Administrative expenses:		
Office and officers' salaries	325,000	_
Supplies	6,000	4.00
Miscellaneous administrative expense	8,700	1.00
Total	\$1,152,000	\$96.00

It is expected that 12,000 units will be sold at a price of \$240 a unit. Maximum sales within the relevant range are 18,000 units.

#### **Instructions**

- 1. Prepare an estimated income statement for 2016.
- 2. What is the expected contribution margin ratio?
- 3. Determine the break-even sales in units and dollars.
- 4. Construct a cost-volume-profit chart indicating the break-even sales.
- 5. What is the expected margin of safety in dollars and as a percentage of sales?
- 6. Determine the operating leverage.

## **Cases & Projects**



#### CP 19-1 Ethics and professional conduct in business

Edward Seymour is a financial consultant to Cornish Inc., a real estate syndicate. Cornish Inc. finances and develops commercial real estate (office buildings). The completed projects are then sold as limited partnership interests to individual investors. The syndicate makes a profit on the sale of these partnership interests. Edward provides financial information for the offering prospectus, which is a document that provides the financial and legal details of the limited partnership offerings. In one of the projects, the bank has

financed the construction of a commercial office building at a rate of 10% for the first four years, after which time the rate jumps to 15% for the remaining 20 years of the mortgage. The interest costs are one of the major ongoing costs of a real estate project. Edward has reported prominently in the prospectus that the break-even occupancy for the first four years is 65%. This is the amount of office space that must be leased to cover the interest and general upkeep costs over the first four years. The 65% break-even is very low and thus communicates a low risk to potential investors. Edward uses the 65% break-even rate as a major marketing tool in selling the limited partnership interests. Buried in the fine print of the prospectus is additional information that would allow an astute investor to determine that the break-even occupancy will jump to 95% after the fourth year because of the contracted increase in the mortgage interest rate. Edward believes prospective investors are adequately informed as to the risk of the investment.

Comment on the ethical considerations of this situation.

#### CP 19-2 Break-even sales, contribution margin

"For a student, a grade of 65 percent is nothing to write home about. But for the airline . . . [industry], filling 65 percent of the seats . . . is the difference between profit and loss.

The [economy] might be just strong enough to sustain all the carriers on a cash basis, but not strong enough to bring any significant profitability to the industry. . . . For the airlines . . ., the emphasis will be on trying to consolidate routes and raise ticket prices. . . ."

Source: Edwin McDowell, "Empty Seats, Empty Beds, Empty Pockets," *The New York Times, January 6*, 1992, p. C3.

The airline industry is notorious for boom and bust cycles. Why is airline profitability very sensitive to these cycles? Do you think that during a down cycle the strategy to consolidate routes and raise ticket prices is reasonable? What would make this strategy succeed or fail? Why?

#### CP 19-3 Break-even analysis

Somerset Inc. has finished a new video game, *Snowboard Challenge*. Management is now considering its marketing strategies. The following information is available:

Anticipated sales price per unit	\$80
Variable cost per unit*	\$35
Anticipated volume	1,000,000 units
Production costs	\$20,000,000
Anticipated advertising	\$15,000,000

^{*}The cost of the video game, packaging, and copying costs.

Two managers, James Hamilton and Thomas Seymour, had the following discussion of ways to increase the profitability of this new offering:

James: I think we need to think of some way to increase our profitability. Do you have any ideas?

Thomas: Well, I think the best strategy would be to become aggressive on price.

James: How aggressive?

Thomas: If we drop the price to \$60 per unit and maintain our advertising budget at \$15,000,000, I think we will generate total sales of 2,000,000 units.

James: I think that's the wrong way to go. You're giving too much up on price. Instead, I think we need to follow an aggressive advertising strategy.

Thomas: How aggressive?

*James*: If we increase our advertising to a total of \$25,000,000, we should be able to increase sales volume to 1,400,000 units without any change in price.

Thomas: I don't think that's reasonable. We'll never cover the increased advertising costs.

Which strategy is best: Do nothing? Follow the advice of Thomas Seymour? Or follow James Hamilton's strategy?



#### CP 19-4 Variable costs and activity bases in decision making

The owner of Warwick Printing, a printing company, is planning direct labor needs for the upcoming year. The owner has provided you with the following information for next year's plans:

	One Color	Two Color	Three Color	Four Color	Total
Number of banners	212	274	616	698	1,800

Each color on the banner must be printed one at a time. Thus, for example, a four-color banner will need to be run through the printing operation four separate times. The total production volume last year was 800 banners, as follows:

	One Color	Two Color	Three Color	Total
Number of banners	180	240	380	800

As you can see, the four-color banner is a new product offering for the up-coming year. The owner believes that the expected 1,000-unit increase in volume from last year means that direct labor expenses should increase by 125% (1,000  $\div$  800). What do you think?

#### CP 19-5 Variable costs and activity bases in decision making

Sales volume has been dropping at Mumford Industries. During this time, however, the Shipping Department manager has been under severe financial constraints. The manager knows that most of the Shipping Department's effort is related to pulling inventory from the warehouse for each order and performing the paperwork. The paperwork involves preparing shipping documents for each order. Thus, the pulling and paperwork effort associated with each sales order is essentially the same, regardless of the size of the order. The Shipping Department manager has discussed the financial situation with senior management. Senior management has responded by pointing out that sales volume has been dropping, so that the amount of work in the Shipping Department should be dropping. Thus, senior management told the Shipping Department manager that costs should be decreasing in the department.

The Shipping Department manager prepared the following information:

Month	Sales Volume	Number of Customer Orders	Sales Volume per Order
January	\$472,000	1,180	400
February	475,800	1,220	390
March	456,950	1,235	370
April	425,000	1,250	340
May	464,750	1,430	325
June	421,200	1,350	312
July	414,000	1,380	300
August	430,700	1,475	292

Given this information, how would you respond to senior management?

#### CP 19-6 Break-even analysis

#### **Group Project**

Break-even analysis is one of the most fundamental tools for managing any kind of business unit. Consider the management of your university or college. In a group, brainstorm some applications of break-even analysis at your university or college. Identify three areas where break-even analysis might be used. For each area, identify the revenues, variable costs, and fixed costs that would be used in the calculation.



# Variable Costing for Management Analysis

## Adobe Systems, Inc.

A ssume that you have three different options for a summer job. How would you evaluate these options? Naturally there are many things to consider, including how much you could earn from each job.

Determining how much you could earn from each job may not be as simple as comparing the wage rate per hour. For example, a job as an office clerk at a local company pays \$8 per hour. A job delivering pizza pays \$10 per hour (including estimated tips), although you must use your own transportation. Another job working in a beach resort over 500 miles away from your home pays \$8 per hour. All three jobs offer 40 hours per week for the whole summer. If these options were ranked according to their pay per hour, the pizza delivery job would be the most attractive. However, the costs associated with each job must also be evaluated. For example, the office job may require that you pay for downtown parking and purchase office clothes. The pizza delivery job will require you to pay for gas and maintenance for your car. The resort job will require you to move to the resort city and incur additional living costs. Only by considering the costs for each job will you be able to determine which job will provide you with the most income.

Just as you should evaluate the relative income of various choices, a business also evaluates the income earned from its choices. Important choices include the products offered and the geographical regions to be served.

A company will often evaluate the profitability of products and regions. For example, **Adobe Systems Inc.**, one of the largest software companies in the world, determines the income earned from its various product lines, such as Acrobat®, Photoshop®, Premier®, and Dreamweaver® software. Adobe uses this information to establish product line pricing, as well as sales, support, and development effort. Likewise, Adobe evaluates the income earned in the geographic regions it serves, such as the United States, Europe, and Asia. Again, such information aids management in managing revenue and expenses within the regions.

In this chapter, how businesses measure profitability using absorption costing and variable costing is discussed. After illustrating and comparing these concepts, how businesses use them for controlling costs, pricing products, planning production, analyzing market segments, and analyzing contribution margins is described and illustrated.

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Describe and illustrate reporting income from operations under absorption and variable costing. Income from Operations Under Absorption Costing and Variable Costing Absorption Costing Variable Costing Units Manufactured Equal Units Sold Units Manufactured Exceed Units Sold Units Manufactured Less Than Units Sold Effects on Income from Operations	EE 20-1 EE 20-2 EE 20-3
Describe and illustrate the effects of absorption and variable costing on analyzing income from operations.  Income Analysis Under Absorption and Variable Costing	EE 20-4
Describe management's use of absorption and variable costing.  Using Absorption and Variable Costing  Controlling Costs  Pricing Products  Planning Production  Analyzing Contribution Margins  Analyzing Market Segments	
Use variable costing for analyzing market segments, including product, territories, and salespersons segments.  Analyzing Market Segments  Sales Territory Profitability Analysis  Product Profitability Analysis  Salesperson Profitability Analysis	<b>EE</b> 20-5
Use variable costing for analyzing and explaining changes in contribution margin as a result of quantity and price factors.  Contribution Margin Analysis	EE 20-6
Describe and illustrate the use of variable costing for service firms.  Variable Costing for Service Firms  Reporting Income from Operations Using Variable Costing for a Service Company  Market Segment Analysis for Service Company  Contribution Margin Analysis	
	At a Glance 20 Page 955





Different regions of the world emphasize different

approaches to reporting income. For example, Scandinavian companies have a strong variable costing tradition, while German cost accountants have developed some of the most advanced absorption costing practices in the world.

# **Income from Operations Under Absorption Costing and Variable Costing**

Income from operations is one of the most important items reported by a company. Depending on the decision-making needs of management, income from operations can be determined using absorption or variable costing.

## **Absorption Costing**

**Absorption costing** is required under generally accepted accounting principles for financial statements distributed to external users. Under absorption costing, the cost of goods manufactured includes direct materials, direct labor, and factory overhead costs. Both fixed and variable factory costs are included as part of factory overhead. In the financial statements, these costs are included in the cost of goods sold (income statement) and inventory (balance sheet).

The reporting of income from operations under absorption costing is as follows:

Sales	\$XXX
Cost of goods sold	XXX
Gross profit	\$XXX
Selling and administrative expenses	XXX
Income from operations	\$XXX

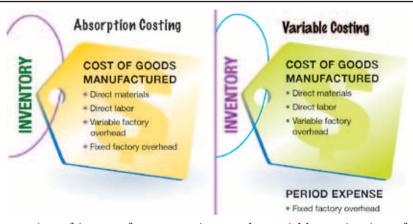
The income statements illustrated in the preceding chapters of this text have used absorption costing.

## **Variable Costing**

For internal use in decision making, managers often use variable costing. Under **variable costing**, sometimes called *direct costing*, the cost of goods manufactured includes only variable manufacturing costs. Thus, the cost of goods manufactured consists of the following:

- · Direct materials
- · Direct labor
- · Variable factory overhead

Under variable costing, *fixed* factory overhead costs are not a part of the cost of goods manufactured. Instead, fixed factory overhead costs are treated as a period expense. Exhibit 1 illustrates the differences between absorption costing and variable costing.



#### **EXHIBIT 1**

Absorption Costing Versus Variable Costing

The reporting of income from operations under variable costing is as follows:

Sales		\$XXX
Variable cost of goods sold		XXX
Manufacturing margin		\$XXX
Variable selling and administrative expenses		XXX
Contribution margin		\$XXX
Fixed costs:		
Fixed manufacturing costs	\$XXX	
Fixed selling and administrative expenses	XXX	XXX
Income from operations		\$XXX

Manufacturing margin is the excess of sales over variable cost of goods sold:

Manufacturing Margin = Sales - Variable Cost of Goods Sold

**Variable cost of goods sold** consists of direct materials, direct labor, and variable factory overhead for the units sold. **Contribution margin** is the excess of manufacturing margin over variable selling and administrative expenses:

Contribution Margin = Manufacturing Margin - Variable Selling and Administrative Expenses

Subtracting fixed costs from contribution margin yields income from operations:

Income from Operations = Contribution Margin - Fixed Costs

To illustrate variable costing and absorption costing, assume that Martinez Co. manufactures 15,000 units, which are sold at a price of \$50. The related costs and expenses for Martinez are as follows:

		Number	Unit
	<b>Total Cost</b>	of Units	Cost
Manufacturing costs:			
Variable	\$375,000	15,000	\$25
Fixed	150,000	15,000	_10
Total	\$525,000		10 \$35
Selling and administrative expenses:			
Variable	\$ 75,000	15,000	\$ 5
Fixed	50,000		
Total	\$125,000		

Exhibit 2 shows the absorption costing income statement prepared for Martinez. The computations are shown in parentheses.

#### EXHIBIT 2

#### Absorption Costing Income Statement

Cost of goods sold (15,000 × \$35).  Gross profit.  \$ Selling and administrative expenses (\$75,000 + \$50,000).	\$750,000 525,000 \$225,000 125,000 \$100,000
-------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------

Absorption costing does not distinguish between variable and fixed costs. All manufacturing costs are included in the cost of goods sold. Deducting the cost of goods sold of \$525,000 from sales of \$750,000 yields gross profit of \$225,000. Deducting selling and administrative expenses of \$125,000 from gross profit yields income from operations of \$100,000.

Exhibit 3 shows the variable costing income statement prepared for Martinez. The computations are shown in parentheses.

#### **EXHIBIT 3**

#### Variable Costing Income Statement

Sales (15,000 × \$50)		\$750,000
Variable cost of goods sold (15,000 × \$25)		375,000
Manufacturing margin		\$375,000
Variable selling and administrative expenses (15,000 $\times$ \$5)		75,000
Contribution margin		\$300,000
Fixed costs:		
Fixed manufacturing costs	\$150,000	
Fixed selling and administrative expenses	50,000	200,000
Income from operations		\$100,000

#### Note:

The variable costing income statement includes only variable manufacturing costs in the cost of goods sold.

Variable costing income reports variable costs separately from fixed costs. Deducting the variable cost of goods sold of \$375,000 from sales of \$750,000 yields the manufacturing margin of \$375,000. Deducting variable selling and administrative expenses of \$75,000 from the manufacturing margin yields the contribution margin of \$300,000. Deducting fixed costs of \$200,000 from the contribution margin yields income from operations of \$100,000.

The contribution margin reported in Exhibit 3 is the same as that used in Chapter 19. That is, the contribution margin is sales less variable costs and expenses. The only difference is that Exhibit 3 reports manufacturing margin before deducting variable selling and administrative expenses.

## Example Exercise 20-1 Variable Costing



Leone Company has the following information for March:

Sales	\$450,000
Variable cost of goods sold	220,000
Fixed manufacturing costs	80,000
Variable selling and administrative expenses	50,000
Fixed selling and administrative expenses	35.000

Determine (a) the manufacturing margin, (b) the contribution margin, and (c) income from operations for Leone Company for the month of March.

#### Follow My Example 20-1

- a. \$230,000 (\$450,000 \$220,000)
- b. \$180,000 (\$230,000 \$50,000)
- c. \$65,000 (\$180,000 \$80,000 \$35,000)

Practice Exercises: PE 20-1A, PE 20-1B

## **Units Manufactured Equal Units Sold**

In Exhibits 2 and 3, Martinez manufactured and sold 15,000 units. Thus, the variable and absorption costing income statements reported the same income from operations of \$100,000. When the number of units manufactured equals the number of units sold, income from operations will be the same under both methods.

#### **Units Manufactured Exceed Units Sold**

When units manufactured exceed the units sold, the variable costing income from operations will be *less* than it is for absorption costing. To illustrate, assume that only 12,000 units of the 15,000 units Martinez manufactured were sold.

Exhibit 4 shows the absorption and variable costing income statements when units manufactured exceed units sold.

ales (12,000 × \$50)		\$600,000
/ariable cost of goods sold:		\$000,000
3	¢275.000	
Variable cost of goods manufactured (15,000 × \$25)	\$375,000	
Less ending inventory (3,000 $\times$ \$25)	75,000	
Variable cost of goods sold		300,000
Nanufacturing margin		\$300,000
ariable selling and administrative expenses (12,000 $\times$ \$5)		60,000
Contribution margin		\$240,000
ixed costs:		
Fixed manufacturing costs	\$150,000	
Fixed selling and administrative expenses	50,000	200,000
ncome from operations		\$ 40,000
icome non operations		7 40,000
Absorption Costing Income Statement		
ales (12,000 × \$50)		\$600,000
Cost of goods sold:		
Cost of goods manufactured (15,000 × \$35)	\$525,000	
Less ending inventory (3,000 × \$35)	105,000	
Cost of goods sold		420,000
Gross profit.		\$180,000
•		
elling and administrative expenses [(12,000 × \$5) + \$50,000]		110,000 \$ 70,000

#### **EXHIBIT 4**

Units Manufactured Exceed Units Sold Exhibit 4 shows a \$30,000 (\$70,000 – \$40,000) difference in income from operations. This difference is due to the fixed manufacturing costs. All of the \$150,000 of fixed manufacturing costs is included as a period expense in the variable costing statement. However, the 3,000 units of ending inventory in the absorption costing statement includes \$30,000 (3,000 units  $\times$  \$10) of fixed manufacturing costs. By being included in inventory, this \$30,000 is thus excluded from the cost of goods sold. Thus, the absorption costing income from operations is \$30,000 higher than the income from operations for variable costing.

## Example Exercise 20-2 Variable Costing—Production Exceeds Sales



Fixed manufacturing costs are \$40 per unit, and variable manufacturing costs are \$120 per unit. Production was 125,000 units, while sales were 120,000 units. Determine (a) whether variable costing income from operations is less than or greater than absorption costing income from operations, and (b) the difference in variable costing and absorption costing income from operations.

#### Follow My Example 20-2

- a. Variable costing income from operations is less than absorption costing income from operations.
- b. \$200,000 (\$40 per unit × 5,000 units)

Practice Exercises: PE 20-2A, PE 20-2B

#### **Units Manufactured Less Than Units Sold**

.....

When the units manufactured are less than the number of units sold, the variable costing income from operations will be *greater* than that of absorption costing. To illustrate, assume that beginning inventory, units manufactured, and units sold for Martinez were as follows:

Beginning inventory	5,000 units
Units manufactured during current period	10,000 units
Units sold during the current period at \$50 per unit	15.000 units

Martinez's manufacturing costs and selling and administrative expenses are as follows:

		Number	Unit
	<b>Total Cost</b>	of Units	Cost
Beginning inventory (5,000 units):			
Manufacturing costs:			
Variable	\$125,000	5,000	\$25
Fixed	50,000	5,000	10
Total	\$175,000		\$35
Current period (10,000 units):			
Manufacturing costs:			
Variable	\$250,000	10,000	\$25
Fixed	150,000	10,000	_15
Total	\$400,000		\$40
Selling and administrative expenses:			_
Variable	\$ 75,000	15,000	\$5
Fixed	50,000		
Total	\$125,000		

Exhibit 5 shows the absorption and variable costing income statement for Martinez when units manufactured are less than units sold.

Tark of manda and d		\$750,000
Cost of goods sold:		
Beginning inventory (5,000 × \$35)	\$175,000	
Cost of goods manufactured (10,000 × \$40)	400,000	
Cost of goods sold		575,00
Gross profit		\$175,00
Selling and administrative expenses (\$75,000 + \$50,000)		125,00
ncome from operations		\$ 50,00
Variable Costing Income Statement Sales (15,000 × \$50)		\$750,00
/ariable cost of goods sold:		
Beginning inventory (5,000 × \$25)	\$125,000	
Variable cost of goods manufactured (10,000 × \$25)	250,000	
Variable cost of goods sold		375,00
Manufacturing margin		\$375,00
Variable selling and administrative expenses (15,000 $\times$ \$5)		75,00
Contribution margin		\$300,00
Fixed costs:		
Fixed manufacturing costs	\$150,000	
Fixed selling and administrative expenses	50,000	200,00

#### **EXHIBIT 5**

Units Manufactured Are Less Than Units Sold

Exhibit 5 shows a \$50,000 (\$100,000 - \$50,000) difference in income from operations. This difference is due to the fixed manufacturing costs. The beginning inventory under absorption costing includes \$50,000 (5,000 units × \$10) of fixed manufacturing costs incurred in the preceding period. By being included in the beginning inventory, this \$50,000 is included in the cost of goods sold for the current period. Under variable costing, this \$50,000 was included as an expense in an income statement of a prior period. Thus, the variable costing income from operations is \$50,000 higher than the income from operations for absorption costing.

### Example Exercise 20-3 Variable Costing—Sales Exceed Production



The beginning inventory is 6,000 units. All of the units that were manufactured during the period and the 6,000 units of beginning inventory were sold. The beginning inventory fixed manufacturing costs are \$60 per unit, and variable manufacturing costs are \$300 per unit. Determine (a) whether variable costing income from operations is less than or greater than absorption costing income from operations, and (b) the difference in variable costing and absorption costing income from operations.

#### Follow My Example 20-3

- a. Variable costing income from operations is greater than absorption costing income from operations.
- b. \$360,000 (\$60 per unit × 6,000 units)

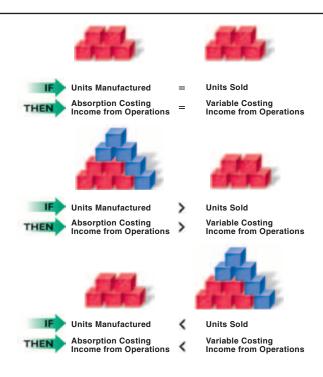
Practice Exercises: PE 20-3A, PE 20-3B

### **Effects on Income from Operations**

The preceding examples illustrate the effects on income from operations of using absorption and variable costing. These effects are summarized in Exhibit 6.

#### **EXHIBIT 6**

Effects on Income from Operations under Absorption and Variable Costing



Describe and illustrate the effects of absorption and variable costing on analyzing income from operations.

# **Income Analysis Under Absorption and Variable Costing**

Whenever the units manufactured differ from the units sold, finished goods inventory is affected. When the units manufactured are greater than the units sold, finished goods inventory increases. Under absorption costing, a portion of this increase is related to the allocation of fixed manufacturing overhead to ending inventory. As a result, increases or decreases in income from operations can be due to changes in inventory levels. In analyzing income from operations, such increases and decreases could be misinterpreted as operating efficiencies or inefficiencies.

To illustrate, assume that Frand Manufacturing Company has no beginning inventory and sales are estimated to be 20,000 units at \$75 per unit. Also, assume that sales will not change if more than 20,000 units are manufactured.

Frand's management is evaluating whether to manufacture 20,000 units (Proposal 1) or 25,000 units (Proposal 2). The costs and expenses related to each proposal follow

Proposal 1: 20,000 Units to Be Manufactured and Sold

	Total Cost	Number of Units	Unit Cost
Manufacturing costs:			
Variable	\$ 700,000	20,000	\$35
Fixed	400,000	20,000	20*
Total	\$1,100,000		20* \$55
Selling and administrative expenses:			
Variable	\$ 100,000	20,000	\$ 5
Fixed	100,000		
Total	\$ 200,000		
*\$400,000 ÷ 20,000 units			

Proposal 2: 25,000 Units to Be Manufactured and 20,000 Units to Be Sold

		Number	Unit
	<b>Total Cost</b>	of Units	Cost
Manufacturing costs:			
Variable	\$ 875,000	25,000	\$35
Fixed	400,000	25,000	16*
Total	\$1,275,000		<u>16</u> * \$51
Selling and administrative expenses:			
Variable	\$ 100,000	20,000	\$ 5
Fixed	100,000		
Total	\$ 200,000		
*\$400,000 ÷ 25,000 units			

The absorption costing income statements for each proposal are shown in Exhibit 7.

Frand Manufacturing Company Absorption Costing Income Statem		
	Proposal 1 20,000 Units Manufactured	Proposal 2 25,000 Units Manufactured
Sales (20,000 units × \$75)	\$1,500,000	\$1,500,000
(20,000 units × \$55)	\$1,100,000	\$1,275,000
(5,000 units × \$51).  Cost of goods sold  Gross profit.	\$1,100,000 \$ 400,000	255,000 \$1,020,000 \$ 480,000
Selling and administrative expenses: (\$100,000 + \$100,000)	200,000 \$ 200,000	200,000 \$ 280,000

#### EXHIBIT 7

Absorption Costing Income Statements for Two Production Levels

Exhibit 7 shows that if Frand manufactures 25,000 units, sells 20,000 units, and adds the 5,000 units to finished goods inventory (Proposal 2), income from operations will be \$280,000. In contrast, if Frand manufactures and sells 20,000 units (Proposal 1), income from operations will be \$200,000. In other words, Frand can increase income from operations by \$80,000 (\$280,000 – \$200,000) by simply increasing finished goods inventory by 5,000 units.

The \$80,000 increase in income from operations under Proposal 2 is caused by the allocation of the fixed manufacturing costs of \$400,000 over a greater number of units manufactured. Specifically, an increase in production from 20,000 units to 25,000 units means that the fixed manufacturing cost per unit decreases from \$20 (\$400,000  $\div$  20,000 units) to \$16 (\$400,000  $\div$  25,000 units). Thus, the cost of goods sold when 25,000 units are manufactured is \$4 per unit less, or \$80,000 less in total (20,000 units sold  $\times$  \$4). Since the cost of goods sold is less, income from operations is \$80,000 more when 25,000 units rather than 20,000 units are manufactured.

Managers should be careful in analyzing income from operations under absorption costing when finished goods inventory changes. Increases in income from operations may be created by simply increasing finished goods inventory. Thus, managers could misinterpret such increases (or decreases) in income from operations as due to changes in sales volume, prices, or costs.

Under variable costing, income from operations is \$200,000, regardless of whether 20,000 units or 25,000 units are manufactured. This is because no fixed manufacturing costs are allocated to the units manufactured. Instead, all fixed manufacturing costs are treated as a period expense.

To illustrate, Exhibit 8 shows the variable costing income statements for Frand for the production of 20,000 units, 25,000 units, and 30,000 units. In each case, the income from operations is \$200,000.

#### **EXHIBIT 8**

Variable Costing Income Statements for Three Production Levels

Frand Manufacturing Company Variable Costing Income Statements				
	20,000 Units Manufactured	25,000 Units Manufactured	30,000 Units Manufactured	
Sales (20,000 units × \$75)	\$1,500,000	\$1,500,000	\$1,500,000	
(20,000 units × \$35)	\$ 700,000	\$ 875,000	\$1,050,000	
Less ending inventory: (0 units × \$35)(5,000 units × \$35)	0	175,000		
(10,000 units × \$35)	\$ 700,000 \$ 800,000	\$ 700,000 \$ 800,000	350,000 \$ 700,000 \$ 800,000	
Variable selling and administrative expenses Contribution margin	100,000 \$ 700,000	100,000 \$ 700,000	100,000 \$ 700,000	
Fixed costs:  Fixed manufacturing costs  Fixed selling and administrative	\$ 400,000	\$ 400,000	\$ 400,000	
expenses  Total fixed costs  Income from operations	100,000 \$ 500,000 \$ 200,000	100,000 \$ 500,000 \$ 200,000	100,000 \$ 500,000 \$ 200,000	

## Integrity, Objectivity, and Ethics in Business



#### **TAKING AN "ABSORPTION HIT"**

Aligning production to demand is a critical decision in business. Managers must not allow the temporary benefits of excess production through higher absorption of fixed costs to guide their decisions. Likewise, if demand falls, production should be dropped and inventory liquidated to match the new demand level, even though earnings will be penalized. The following interchange provides an example of an appropriate response to lowered demand for H.J. Heinz Company:

**Analyst's question:** It seems....that you're guiding to a little bit of a drop in performance between 3Q (third Quarter) and 4Q (fourth Quarter)....if so, maybe you could walk us through some of the drivers of that relative softness.

**Heinz executive's response:** No, I think, frankly, we're real pleased with the performance in the business....We're

also aggressively taking out inventory in the fourth quarter. And as you know, as you reduce inventory, you take an absorption hit. You're pulling basically fixed costs off the balance sheet into the P&L and there's a hit associated with that, but we think that's the right thing to do, to pull inventory out and to drive cash flow. So now, we feel very good about the business and feel very good about the fact that we're taking it to the middle of the range and taking up the bottom end of our guidance.

Management operating with integrity will seek the tangible benefits of reducing inventory, even though there may be an adverse impact on published financial statements caused by absorption costing.

Source of question and response from http://seekingalpha.com/article/375151-h-j-heinz-management-discusses-q3-2012-results-earnings-call-transcript?page=6&p=qanda. Accessed February 2012.

As shown, absorption costing may encourage managers to produce inventory. This is because producing inventory absorbs fixed manufacturing costs, which increases income from operations. However, producing inventory leads to higher handling, storage, financing, and obsolescence costs. For this reason, many accountants believe that variable costing should be used by management for evaluating operating performance.

## Example Exercise 20-4 Analyzing Income Under Absorption and Variable Costing



Variable manufacturing costs are \$100 per unit, and fixed manufacturing costs are \$50,000. Sales are estimated to be 4.000 units.

- a. How much would absorption costing income from operations differ between a plan to produce 4,000 units and a plan to produce 5,000 units?
- b. How much would variable costing income from operations differ between the two production plans?

#### Follow My Example 20-4

- a. \$10,000 greater in producing 5,000 units. 4,000 units  $\times$  (\$12.50\(^1 \\$10.00\(^2\)), or [1,000 units  $\times$  (\$50,000 \(\div 5,000\) units)].
- b. There would be no difference in variable costing income from operations between the two plans.

1\$50,000 ÷ 4,000 units

²\$50,000 ÷ 5,000 units

Practice Exercises: PE 20-4A, PE 20-4B

## **Using Absorption and Variable Costing**

Each decision-making situation should be carefully analyzed in deciding whether absorption or variable costing reporting would be more useful. As a basis for discussion, the use of absorption and variable costing in the following decision-making situations is described:



- Controlling costs
- Pricing products
- · Planning production
- · Analyzing contribution margins
- · Analyzing market segments

The role of accounting reports in these decision-making situations is shown in Exhibit 9.



#### **EXHIBIT 9**

Accounting Reports and Management Decisions

### **Controlling Costs**

All costs are controllable in the long run by someone within a business. However, not all costs are controllable at the same level of management. For example, plant supervisors control the use of direct materials in their departments. They have no control, though, over insurance costs related to the property, plant, and equipment.

For a level of management, **controllable costs** are costs that can be influenced (increased or decreased) by management at that level. **Noncontrollable costs** are costs that another level of management controls. This distinction is useful for reporting costs to those responsible for their control.

Variable manufacturing costs are controlled by operating management. In contrast, fixed manufacturing overhead costs such as the salaries of production supervisors are normally controlled at a higher level of management. Likewise, control of the variable and fixed operating expenses usually involves different levels of management. Since fixed costs and expenses are reported separately under variable costing, variable costing reports are normally more useful than absorption costing reports for controlling costs.

### **Pricing Products**

Many factors enter into determining the selling price of a product. However, the cost of making the product is significant in all pricing decisions.

In the short run, fixed costs cannot be avoided. Thus, the selling price of a product should at least be equal to the variable costs of making and selling it. Any price above this minimum selling price contributes to covering fixed costs and generating income. Since variable costing reports variable and fixed costs and expenses separately, it is often more useful than absorption costing for setting short-run prices.

In the long run, a company must set its selling price high enough to cover all costs and expenses (variable and fixed) and generate income. Since absorption costing includes fixed and variable costs in the cost of manufacturing a product, absorption costing is often more useful than variable costing for setting long-term prices.

## **Planning Production**

In the short run, planning production is limited to existing capacity. In many cases, operating decisions must be made quickly before opportunities are lost.

To illustrate, a company with seasonal demand for its products may have an opportunity to obtain an off-season order that will not interfere with its current production schedule. The relevant factors for such a short-run decision are the additional revenues and the additional variable costs associated with the order. If the revenues from the order exceed the related variable costs, the order will increase contribution margin and, thus, increase the company's income from operations. Since variable costing reports contribution margin, it is often more useful than absorption costing in such cases.

In the long run, planning production can include expanding existing capacity. Thus, when analyzing and evaluating long-run sales and operating decisions, absorption costing, which considers fixed and variable costs, is often more useful.

## **Analyzing Contribution Margins**

For planning and control purposes, managers often compare planned and actual contribution margins. For example, an increase in the price of fuel could have a significant impact on the planned contribution margins of an airline. The use of variable costing as a basis for such analyses is described and illustrated later in this chapter.

## **Analyzing Market Segments**

Market analysis determines the profit contributed by the market segments of a company. A **market segment** is a portion of a company that can be analyzed using sales,

Major hotel chains, such as Marriott, Hilton, and Hyatt,

often provide "weekend getaway" packages, which provide discounts for weekend stays in their city hotels. As long as the weekend rates exceed the variable costs, the "weekend getaway" pricing will contribute to the hotel's short-run profitability.



## Business Connection

#### **DIRECT MATERIALS COST**

Apple has become one of the most financially successful companies of the past decade by using variable cost information to carefully price its iPod family of products. The cost of an iPod consists almost entirely of direct materials and other variable costs. For example, Apple's sixth generation iPod nano was reported to have a total cost of \$45.10, of which \$43.73 is direct materials. Thus, when designing a new iPod or iPhone, Apple has to carefully balance product features with the variable cost of direct materials. For the sixth generation iPod nano, Apple added touch screen technology and a more powerful battery, while removing the camera feature. This careful balancing of cost and functionality allowed Apple to offer a new generation of iPod nano at an enticing price, highlighting how Apple's awareness and understanding of variable cost information has been a key element of the company's financial success.

Source: A. Rassweiler, "ISuppli Estimates New iPod Nano Bill of Materials at \$43.73," iSuppli, Applied Market Intelligence.

costs, and expenses to determine its profitability. Examples of market segments include sales territories, products, salespersons, and customers. Variable costing as an aid in decision making regarding market segments is discussed next.

## **Analyzing Market Segments**

Companies can report income for internal decision making using either absorption or variable costing. Absorption costing is often used for long-term analysis of market segments. This type of analysis is illustrated in Chapter 26. Variable costing is often used for shortterm analysis of market segments. In this section, segment profitability reporting using variable costing is described and illustrated.

Most companies prepare variable costing reports for each product. These reports are often used for product pricing and deciding whether to discontinue a product. In addition, variable costing reports may be prepared for geographic areas, customers, distribution channels, or salespersons. A distribution channel is the method for selling a product to a customer.

To illustrate analysis of market segments using variable costing, the following data for the month ending March 31 for Camelot Fragrance Company are used:

#### **Camelot Fragrance Company** Sales and Production Data For the Month Ended March 31

	Northern	Southern	
	Territory	Territory	Total
Sales:			
Gwenevere	\$60,000	\$30,000	\$ 90,000
Lancelot	20,000	50,000	70,000
Total territory sales	\$80,000	\$80,000	\$160,000
Variable production costs:			
Gwenevere (12% of sales)	\$ 7,200	\$ 3,600	\$ 10,800
Lancelot (12% of sales)	2,400	6,000	8,400
Total variable production cost by territory	\$ 9,600	\$ 9,600	\$ 19,200
Promotion costs:			
Gwenevere (variable at 30% of sales)	\$18,000	\$ 9,000	\$ 27,000
Lancelot (variable at 20% of sales)	4,000	10,000	14,000
Total promotion cost by territory	\$22,000	\$19,000	\$ 41,000
Sales commissions:			
Gwenevere (variable at 20% of sales)	\$12,000	\$ 6,000	\$ 18,000
Lancelot (variable at 10% of sales)	2,000	5,000	7,000
Total sales commissions by territory	\$14,000	\$11,000	\$ 25,000



territories, and salespersons segments.

Camelot Fragrance manufactures and sells the Gwenevere perfume for women and the Lancelot cologne for men. To simplify, no inventories are assumed to exist at the beginning or end of March.

## **Sales Territory Profitability Analysis**

An income statement presenting the contribution margin by sales territories is often used in evaluating past performance and in directing future sales efforts. Sales territory profitability analysis may lead management to do the following:

- · Reduce costs in lower-profit sales territories
- · Increase sales efforts in higher-profit territories

To illustrate sales territory profitability analysis, Exhibit 10 shows the contribution margin for the Northern and Southern territories of Camelot Fragrance Company. As Exhibit 10 indicates, the Northern Territory is generating \$34,400 of contribution margin, while the Southern Territory is generating \$40,400 of contribution margin.

#### EXHIBIT 10

Contribution Margin by Sales Territory Report

Camelot Fragrance Company Contribution Margin by Sales Territory For the Month Ended March 31				
	Northern	Territory	Southern	Territory
Sales		\$80,000		\$80,000
Variable cost of goods sold		9,600		9,600
Manufacturing margin		\$70,400		\$70,400
Variable selling expenses:				
Promotion costs	\$22,000		\$19,000	
Sales commissions	14,000	36,000	11,000	30,000
Contribution margin		\$34,400		\$40,400
Contribution margin ratio		43%		50.5%

In addition to the contribution margin, the contribution margin ratio for each territory is shown in Exhibit 10. The contribution margin ratio is computed as follows:

Contribution Margin Ratio = 
$$\frac{\text{Contribution Margin}}{\text{Sales}}$$

Exhibit 10 indicates that the Northern Territory has a contribution margin ratio of 43% (\$34,400 ÷ \$80,000). In contrast, the Southern Territory has a contribution margin ratio of 50.5% (\$40,400 ÷ \$80,000).

The difference in profit of the Northern and Southern territories is due to the difference in sales mix between the territories. **Sales mix**, sometimes referred to as *product mix*, is the relative amount of sales among the various products. The sales mix is computed by dividing the sales of each product by the total sales of each territory. Sales mix of the Northern and Southern territories is as follows:

	Norther	n Territory	Southe	n Territory
Product	Sales	Sales Mix	Sales	Sales Mix
Gwenevere	\$60,000	75%	\$30,000	37.5%
Lancelot	20,000	25	50,000	62.5
Total	\$80,000	100%	\$80,000	100.0%

The Coca-Cola Company earns over 75% of its total corporate profits

total corporate profits outside of the United States. As a result, Coca-Cola management continues to expand operations and sales efforts around the world.

As shown, 62.5% of the Southern Territory's sales are sales of Lancelot. Since the Southern Territory's contribution margin (\$40,400) is higher (as shown in Exhibit 10) than that of the Northern Territory (\$34,400), Lancelot must be more profitable than Gwenevere. To verify this, product profitability analysis is performed.

### **Product Profitability Analysis**

A company should focus its sales efforts on products that will provide the maximum total contribution margin. In doing so, product profitability analysis is often used by management in making decisions regarding product sales and promotional efforts.

To illustrate product profitability analysis, Exhibit 11 shows the contribution margin by product for Camelot Fragrance Company.

Contribution	Fragrance Co Margin by Pr onth Ended M	oduct Line		
	Gwen	ievere	Land	elot
Sales		\$90,000		\$70,000
Variable cost of goods sold		10,800		8,400
Manufacturing margin		\$79,200		\$61,600
Variable selling expenses:				
Promotion costs	\$27,000		\$14,000	
Sales commissions	18,000	45,000	7,000	21,000
Contribution margin		\$34,200		\$40,600
Contribution margin ratio		38%		58%

**EXHIBIT 11** 

Contribution Margin by Product Line Report

Exhibit 11 indicates that Lancelot's contribution margin ratio (58%) is greater than Gwenevere's (38%). Lancelot's higher contribution margin ratio is a result of its lower promotion and sales commissions costs. Thus, management should consider the following:

- · Emphasizing Lancelot in its marketing plans
- · Reducing Gwenevere's promotion and sales commissions costs
- · Increasing the price of Gwenevere

### **Salesperson Profitability Analysis**

A salesperson profitability report is useful in evaluating sales performance. Such a report normally includes total sales, variable cost of goods sold, variable selling expenses, contribution margin, and contribution margin ratio for each salesperson.

Exhibit 12 illustrates such a salesperson profitability report for three salespersons in the Northern Territory of Camelot Fragrance Company. The exhibit indicates that Beth Williams produced the greatest contribution margin (\$15,200), but had the lowest contribution margin ratio (38%). Beth sold \$40,000 of product, which is twice as much product as the other two salespersons. However, Beth sold only Gwenevere, which has the lowest contribution margin ratio (from Exhibit 11). The other two salespersons sold equal amounts of Gwenevere and Lancelot. As a result, Inez Rodriguez and Deshawn Thomas had higher contribution margin ratios because they sold more Lancelot. The Northern Territory manager could use this report to encourage Inez and Deshawn to sell more total product, while encouraging Beth to sell more Lancelot.

#### **EXHIBIT 12**

Contribution Margin by Salesperson Report

#### **Camelot Fragrance Company Contribution Margin by Salesperson—Northern Territory** For the Month Ended March 31 Northern Inez Deshawn Beth Territory-**Rodriguez** Williams **Thomas** Total Sales ..... \$20,000 \$20,000 \$40,000 \$80,000 Variable cost of goods sold ..... 2,400 2,400 4,800 9,600 Manufacturing margin ..... \$17,600 \$17,600 \$35,200 \$70,400 Variable selling expenses: \$ 5,000 \$ 5,000 Promotion costs..... \$12,000 \$22,000 3,000 3,000 8,000 14,000 \$ 8,000 \$ 8,000 \$20,000 \$36,000 Contribution margin..... \$ 9,600 \$ 9,600 \$15,200 \$34,400 Contribution margin ratio..... 48% 48% 38% 43% 50% Sales mix (% Lancelot sales) ..... 25%

Other factors should also be considered in evaluating salespersons' performance. For example, sales growth rates, years of experience, customer service, territory size, and actual performance compared to budgeted performance may also be important.

### Example Exercise 20-5 Contribution Margin by Segment



The following data are for Moss Creek Apparel:

	East	West
Sales volume (units):		
Shirts	6,000	5,000
Shorts	4,000	8,000
Sales price:		
Shirts	\$12	\$13
Shorts	\$16	\$18
Variable cost per unit:		
Shirts	\$ 7	\$ 7
Shorts	\$10	\$10

Determine the contribution margin for (a) Shorts and (b) the West Region.

### Follow My Example 20-5

- a.  $$88,000 [4,000 \text{ units} \times ($16 $10)] + [8,000 \text{ units} \times ($18 $10)]$
- b.  $\$94,000 [5,000 \text{ units} \times (\$13 \$7)] + [8,000 \text{ units} \times (\$18 \$10)]$

Practice Exercises: PE 20-5A, PE 20-5B

## Service Focus

#### CHIPOTLE MEXICAN GRILL CONTRIBUTION MARGIN BY STORE

Chipotle Mexican Grill's annual report identifies revenues and costs for its company-owned restaurant operations. Assume that food, beverage, packaging, and labor are variable and that occupancy and other expenses are fixed. A contribution margin and income from operations can be constructed for the restaurants as follows for the year ended December 31, 2013 (in thousands):

Sales		\$3,214,591
Variable restaurant expenses:		
Food, beverage, and packaging	\$1,073,514	
Labor	739,800	
Total variable restaurant operating costs		1,813,314
Contribution margin		\$1,401,277
Occupancy and other expenses		546,508
Income from operations		\$ 854,769

The annual report also indicates that Chipotle Mexican Grill has 1,595 restaurants, all company-owned. Dividing the numbers above by 1,595 yields the contribution margin and income from operations per restaurant as follows (in thousands):

Sales	\$2,015
Variable restaurant expenses	1,137
Contribution margin	\$ 878
Occupancy and other expenses	343
Income from operations	\$ 535

Chipotle Mexican Grill can use this information for pricing products; evaluating the sensitivity of store profitability to changes in sales volume, prices, and costs; and analyzing profitability by geographic segment.

Source: Chipotle Mexican Grill, Inc. Form 10-K. Annual Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. For the fiscal year ended December 31, 2013. Securities and Exchange Commission, Washington D.C. 20549.

## **Contribution Margin Analysis**

Managers often use contribution margin in planning and controlling operations. In doing so, managers use contribution margin analysis. **Contribution margin analysis** focuses on explaining the differences between planned and actual contribution margins.

Contribution margin is defined as sales less variable costs. Thus, a difference between the planned and actual contribution margin may be caused by an increase or a decrease in:

- Sales
- Variable costs

An increase or a decrease in sales or variable costs may in turn be due to an increase or a decrease in the:

- · Number of units sold
- Unit sales price or unit cost

The effects of the preceding factors on sales or variable costs may be stated as follows:

 Quantity factor: The effect of a difference in the number of units sold, assuming no change in unit sales price or unit cost. The sales quantity factor and the variable cost quantity factor are computed as follows:

 $Sales\ Quantity\ Factor = (Actual\ Units\ Sold\ -\ Planned\ Units\ of\ Sales) \times Planned\ Sales\ Price$   $Variable\ Cost\ Quantity\ Factor = (Planned\ Units\ of\ Sales\ -\ Actual\ Units\ Sold) \times Planned\ Unit\ Cost$ 

The preceding factors are computed so that a positive amount increases contribution margin and a negative amount decreases contribution margin.

Use variable costing for analyzing and explaining changes in contribution margin as a result of

quantity and price factors.

• **Unit price factor** or *unit cost factor*: The effect of a difference in unit sales price or unit cost on the number of units sold. The unit price factor and unit cost factor are computed as follows:

 $\textit{Unit Price Factor} = (\textit{Actual Selling Price per Unit} - \textit{Planned Selling Price per Unit}) \times \textit{Actual Units Sold}$ 

Unit Cost Factor = (Planned Cost per Unit – Actual Cost per Unit) × Actual Units Sold

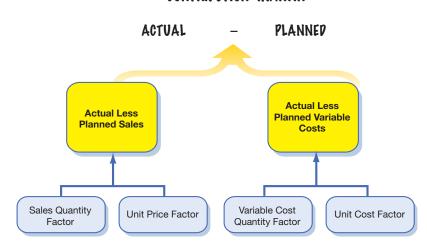
The preceding factors are computed so that a positive amount increases contribution margin and a negative amount decreases contribution margin.

The effects of the preceding factors on contribution margin are summarized in Exhibit 13.

#### **EXHIBIT 13**

#### Contribution Margin Analysis

#### CONTRIBUTION MARGIN



To illustrate, the following data for the year ended December 31, for Noble Inc., which sells a single product, are used:¹

	Actual	Planned
Sales	\$937,500	\$800,000
Less: Variable cost of goods sold	\$425,000	\$350,000
Variable selling and administrative expenses	162,500	125,000
Total	\$587,500	\$475,000
Contribution margin	\$350,000	\$325,000
Number of units sold	125,000	100,000
Per unit:		
Sales price	\$7.50	\$8.00
Variable cost of goods sold	3.40	3.50
Variable selling and administrative expenses	1.30	1.25

Exhibit 14 shows the contribution margin analysis report for Noble Inc. for the year ended December 31. The exhibit indicates that the favorable difference of \$25,000 (\$350,000 – \$325,000) between the actual and planned contribution margins was due in large part to an increase in the quantity sold (sales quantity factor) of \$200,000. This \$200,000 increase was partially offset by a decrease in the unit sales price (unit price factor) of \$62,500 and an increase in the amount of variable costs of \$112,500 (\$75,000 + \$37,500).

¹ To simplify, it is assumed that Noble Inc. sells a single product. The analysis would be more complex, but the principles would be the same, if more than one product were sold.

Noble Inc. Contribution Margin Analysis For the Year Ended December 31		
Planned contribution margin		\$325,000
Effect of changes in sales:		
Sales quantity factor (125,000 units – 100,000 units) $\times$ \$8.00	\$200,000	
Unit price factor (\$7.50 – \$8.00) × 125,000 units	-62,500	
Total effect of changes in sales		137,500
Effect of changes in variable cost of goods sold:		
Variable cost quantity factor (100,000 units – 125,000 units) $\times$ \$3.50	-\$ 87,500	
Unit cost factor (\$3.50 – \$3.40) × 125,000 units	12,500	
Total effect of changes in variable cost of goods sold		-75,000
Effect of changes in selling and administrative expenses:		
Variable cost quantity factor (100,000 units – 125,000 units) $\times$ \$1.25	-\$ 31,250	
Unit cost factor (\$1.25 – \$1.30) × 125,000 units	6,250	
Total effect of changes in selling and administrative expenses		37,500
Actual contribution margin		\$350,000

#### **EXHIBIT 14**

Contribution Margin Analysis Report

The contribution margin analysis reports are useful to management in evaluating past performance and in planning future operations. For example, the impact of the \$0.50 reduction in the unit sales price by Noble Inc. on the number of units sold and on the total sales for the year is useful information in determining whether further price reductions might be desirable.

The contribution margin analysis report also highlights the impact of changes in unit variable costs and expenses. For example, the \$0.05 increase in the unit variable selling and administrative expenses might be a result of increased advertising expenditures. If so, the increase in the number of units sold could be attributed to both the \$0.50 price reduction and the increased advertising.

### Example Exercise 20-6 Contribution Margin Analysis



The actual price for a product was \$48 per unit, while the planned price was \$40 per unit. The volume increased by 5,000 units to 60,000 actual total units. Determine (a) the quantity factor and (b) the price factor for sales.

### Follow My Example 20-6

- a. \$200,000 increase in sales (5,000 units  $\times$  \$40 per unit)
- b. \$480,000 increase in sales [(\$48 \$40)  $\times$  60,000 units]

Practice Exercises: PE 20-6A, PE 20-6B

## **Variable Costing for Service Firms**

Variable costing and the use of variable costing for manufacturing firms have been discussed earlier in this chapter. Service companies also use variable costing, contribution margin analysis, and segment analysis.

# Reporting Income from Operations Using Variable Costing for a Service Company

Unlike a manufacturing company, a service company does not make or sell a product. Thus, service companies do not have inventory. Since service companies have no inventory, they do not use absorption costing to allocate fixed costs. In addition, variable costing reports of service companies do not report a manufacturing margin.





To illustrate variable costing for a service company, Blue Skies Airlines Inc., which operates as a small commercial airline, is used. The variable and fixed costs of Blue Skies are shown in Exhibit 15.

#### **EXHIBIT 15**

Costs of Blue Skies Airlines Inc.

Cost	Amount	<b>Cost Behavior</b>	<b>Activity Base</b>
Depreciation expense	\$3,600,000	Fixed	
Food and beverage service expense	444,000	Variable	Number of passengers
Fuel expense	4,080,000	Variable	Number of miles flown
Rental expense	800,000	Fixed	
Selling expense	3,256,000	Variable	Number of passengers
Wages expense	6,120,000	Variable	Number of miles flown

As discussed in Chapter 19, a cost is classified as a fixed or variable cost according to how it changes relative to an activity base. A common activity for a manufacturing firm is the number of units produced. In contrast, most service companies use several activity bases.

To illustrate, Blue Skies uses the activity base *number of passengers* for food and beverage service and selling expenses. Blue Skies uses *number of miles flown* for fuel and wage expenses.

The variable costing income statement for Blue Skies, assuming revenue of \$19,238,000, is shown in Exhibit 16.

#### EXHIBIT 16

Variable Costing Income Statement for a Service Company

Blue Skies Airlines Inc. Variable Costing Income Statement For the Month Ended April 30, 2016			
Revenue		\$19,238,000	
Variable costs:			
Fuel expense	\$4,080,000		
Wages expense	6,120,000		
Food and beverage service expense	444,000		
Selling expense	3,256,000		
Total variable costs		13,900,000	
Contribution margin		\$ 5,338,000	
Fixed costs:			
Depreciation expense	\$3,600,000		
Rental expense	800,000		
Total fixed costs		4,400,000	
Income from operations		\$ 938,000	

Unlike a manufacturing company, Exhibit 16 does not report cost of goods sold, inventory, or manufacturing margin. However, as shown in Exhibit 16, contribution margin is reported separately from income from operations.

## **Market Segment Analysis for Service Company**

A contribution margin report for service companies can be used to analyze and evaluate market segments. Typical segments for various service companies are shown in Exhibit 17.

Service Industry	Market Segments
Electric power	Regions, customer types (industrial, consumer)
Banking	Customer types (commercial, retail), products (loans, savings accounts)
Airlines	Products (passengers, cargo), routes
Railroads	Products (commodity type), routes
Hotels	Hotel properties
Telecommunications	Customer type (commercial, retail), service type (voice, data)
Health care	Procedure, payment type (Medicare, insured)

#### **EXHIBIT 17**

Service Industry Market Segments

To illustrate, a contribution margin report segmented by route is used for Blue Skies Airlines Inc. In preparing the report, the following data for April are used:

	Chicago/Atlanta	Atlanta/LA	LA/Chicago
Average ticket price per passenger	\$400	\$1,075	\$805
Total passengers served	16,000	7,000	6,600
Total miles flown	56,000	88,000	60,000

The variable costs per unit are as follows:

Fuel	\$ 20 per mile
Wages	30 per mile
Food and beverage service	15 per passenger
Selling	110 per passenger

A contribution margin report for Blue Skies is shown in Exhibit 18. The report is segmented by the routes (city pairs) flown.

Blue Skies Airlines Inc. Contribution Margin by Route For the Month Ended April 30				
	Chicago/ Atlanta	Atlanta/ Los Angeles	Los Angeles/ Chicago	Total
Revenue				
(Ticket price $\times$ No. of passengers)	\$ 6,400,000	\$ 7,525,000	\$ 5,313,000	\$19,238,000
Aircraft fuel				
(\$20 × No. of miles flown)	(1,120,000)	(1,760,000)	(1,200,000)	(4,080,000)
Wages and benefits	(1.690.000)	(2.640.000)	(1.800.000)	(6.120.000)
(\$30 × No. of miles flown)	(1,680,000)	(2,640,000)	(1,800,000)	(6,120,000)
(\$15 × No. of passengers)	(240,000)	(105,000)	(99,000)	(444,000)
Selling expenses				
$($110 \times No. \text{ of passengers}) \dots$	(1,760,000)	(770,000)	(726,000)	(3,256,000)
Contribution margin	\$ 1,600,000	\$ 2,250,000	\$ 1,488,000	\$ 5,338,000
Contribution margin ratio* (rounded)	25%	30%	28%	28%
*Contribution margin/revenue				

Exhibit 18 indicates that the Chicago/Atlanta route has the lowest contribution margin ratio of 25%. In contrast, the Atlanta/Los Angeles route has the highest contribution margin ratio of 30%.

## **Contribution Margin Analysis**

Blue Skies Airlines Inc. is also used to illustrate contribution margin analysis. Specifically, assume that Blue Skies decides to try to improve the contribution margin of its Chicago/Atlanta route during May by decreasing ticket prices. Thus, Blue Skies

#### **EXHIBIT 18**

Contribution Margin by Segment Report for a Service Company decreases the ticket price from \$400 to \$380 beginning May 1. As a result, the number of tickets sold (passengers) increased from 16,000 to 20,000. However, the cost per mile also increased during May from \$20 to \$22 due to increasing fuel prices.

The actual and planned results for the Chicago/Atlanta route during May follow. The planned amounts are based on the April results without considering the price change or cost per mile increase. The highlighted numbers indicate changes during May.

	Chicago/Atlanta Route	
	Actual, May	Planned, May
Revenue	\$7,600,000	\$6,400,000
Less variable expenses:		
Aircraft fuel	\$1,232,000	\$1,120,000
Wages and benefits	1,680,000	1,680,000
Food and beverage service	300,000	240,000
Selling expenses and commissions	2,200,000	1,760,000
Total	\$5,412,000	\$4,800,000
Contribution margin	\$2,188,000	\$1,600,000
Contribution margin ratio	29%	25%
Number of miles flown	56,000	56,000
Number of passengers flown	20,000	16,000
Per unit:		
Ticket price	\$380	\$400
Fuel expense	22	20
Wages expense	30	30
Food and beverage service expense	15	15
Selling expense	110	110

Using the preceding data, a contribution margin analysis report can be prepared for the Chicago/Atlanta route for May as shown in Exhibit 19. Since the planned and actual wages and benefits expense are the same (\$1,680,000), its quantity and unit cost factors are not included in Exhibit 19.

#### **EXHIBIT 19**

Contribution Margin Analysis Report— Service Company

Blue Skies Airlines Inc. Contribution Margin Analysis Chicago/Atlanta Route For the Month Ended May 31		
Planned contribution margin		\$1,600,000
Effect of changes in revenue:		
Revenue quantity factor (20,000 pass. – 16,000 pass.) × \$400	\$1,600,000	
Unit price factor (\$380 – \$400) × 20,000 passengers	(400,000)	1,200,000
Effect of changes in fuel cost:		1,200,000
Variable cost quantity factor (56,000 miles – 56,000 miles) × \$20	\$ 0	
Unit cost factor (\$20 – \$22) × 56,000 miles	(112,000)	
Total effect of changes in fuel costs		(112,000)
Effect of changes in food and beverage expenses:  Variable cost quantity factor (16,000 pass. – 20,000 pass.) × \$15	\$ (60,000)	
Unit cost factor (\$15 – \$15) × 20,000 passengers	0	
Total effect of changes in food and beverage expenses		(60,000)
Effect of changes in selling and commission expenses:		
Variable cost quantity factor (16,000 pass. – 20,000 pass.) $\times$ \$110	\$ (440,000)	
Unit cost factor (\$110 – \$110) × 20,000 passengers	0	(440,000)
Total effect of changes in selling and administrative expenses  Actual contribution margin		(440,000) \$2,188,000
Actual Contribution margin		72,100,000

Exhibit 19 indicates that the price decrease generated an additional \$1,200,000 in revenue. This consists of \$1,600,000 from an increased number of passengers (revenue quantity factor) and a \$400,000 revenue reduction from the decrease in ticket price (unit price factor).

The increased fuel costs (by \$2 per mile) reduced the contribution margin by \$112,000 (unit cost factor). The increased number of passengers also increased the food and beverage service costs by \$60,000 and the selling costs by \$440,000 (variable cost quantity factors). The net increase in contribution margin is \$588,000 (\$2,188,000 - \$1,600,000).

# At a Glance 20



#### Describe and illustrate reporting income from operations under absorption and variable costing.

**Key Points** Under absorption costing, the cost of goods manufactured is comprised of all direct materials, direct labor, and factory overhead costs (both fixed and variable). Under variable costing, the cost of goods manufactured is composed of only variable costs: direct materials, direct labor, and variable factory overhead costs. Fixed factory overhead costs are considered a period expense.

The variable costing income statement is structured differently than a traditional absorption costing income statement. Sales less variable cost of goods sold is presented as manufacturing margin. Manufacturing margin less variable selling and administrative expenses is presented as contribution margin. Contribution margin less fixed costs is presented as income from operations.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe the difference between absorption and variable costing.		
• Prepare a variable costing income statement for a manufacturer.	EE20-1	PE20-1A, 20-1B
<ul> <li>Evaluate the difference between the variable and absorption costing income statements when production exceeds sales.</li> </ul>	EE20-2	PE20-2A, 20-2B
<ul> <li>Evaluate the difference between the variable and absorption costing income statements when sales exceed production.</li> </ul>	EE20-3	PE20-3A, 20-3B



#### Describe and illustrate the effects of absorption and variable costing on analyzing income from operations.

**Key Points** Management should be aware of the effects of changes in inventory levels on income from operations reported under variable costing and absorption costing. If absorption costing is used, managers could misinterpret increases or decreases in income from operations due to changes in inventory levels to be the result of operating efficiencies or inefficiencies.

Learning Outcome	Example Exercises	Practice Exercises
<ul> <li>Determine absorption costing and variable costing income under different planned levels of production for a given sales level.</li> </ul>	EE20-4	PE20-4A, 20-4B



#### Describe management's use of absorption and variable costing.

**Key Points** Variable costing is especially useful at the operating level of management because the amount of variable manufacturing costs are controllable at this level. The fixed factory overhead costs are ordinarily controllable by a higher level of management.

In the short run, variable costing may be useful in establishing the selling price of a product. This price should be at least equal to the variable costs of making and selling the product. In the long run, however, absorption costing is useful in establishing selling prices because all costs must be covered and a reasonable amount of operating income earned.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe management's use of variable and absorption costing for controlling costs, pricing products, planning production, analyzing contribution margins, and analyzing market segments.</li> </ul>		



#### Use variable costing for analyzing market segments, including product, territories, and salespersons segments.

**Key Points** Variable costing can support management decision making in analyzing and evaluating market segments, such as territories, products, salespersons, and customers. Contribution margin reports by segment can be used by managers to support price decisions, evaluate cost changes, and plan volume changes.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe management's uses of contribution margin reports by segment.</li> </ul>		
• Prepare a contribution margin report by sales territory.		
• Prepare a contribution margin report by product.		
• Prepare a contribution margin report by salesperson.	EE20-5	PE20-5A, 20-5B



## Use variable costing for analyzing and explaining changes in contribution margin as a result of quantity and price factors.

**Key Points** Contribution margin analysis is the systematic examination of differences between planned and actual contribution margins. These differences can be caused by an increase/decrease in the amount of sales or variable costs, which can be caused by changes in the amount of units sold, unit sales price, or unit cost.

Learning Outcome	Example Exercises	Practice Exercises
Prepare a contribution margin analysis identifying	EE20-6	PE20-6A, 20-6B
changes between actual and planned contribution		
margin by price/cost and quantity factors.		



#### Describe and illustrate the use of variable costing for service firms.

**Key Points** Service firms will not have inventories, manufacturing margin, or cost of goods sold. Service firms can prepare variable costing income statements and contribution margin reports for market segments. In addition, service firms can use contribution margin analysis to plan and control operations.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Prepare a variable costing income statement for a service firm.</li> </ul>		
<ul> <li>Prepare contribution margin reports by market segments for a service firm.</li> </ul>		
Prepare a contribution margin analysis for a service firm.		

## **Key Terms**

absorption costing (934) contribution margin (935) contribution margin analysis (949) controllable costs (944) manufacturing margin (935) market segment (944) noncontrollable costs (944) quantity factor (949) sales mix (946) unit price (cost) factor (950) variable cost of goods sold (935) variable costing (935)

## **Illustrative Problem**

During the current period, McLaughlin Company sold 60,000 units of product at \$30 per unit. At the beginning of the period, there were 10,000 units in inventory and McLaughlin Company manufactured 50,000 units during the period. The manufacturing costs and selling and administrative expenses were as follows:

		Number	
	<b>Total Cost</b>	of Units	<b>Unit Cost</b>
Beginning inventory:			
Direct materials	\$ 67,000	10,000	\$ 6.70
Direct labor	155,000	10,000	15.50
Variable factory overhead	18,000	10,000	1.80
Fixed factory overhead	20,000	10,000	2.00
Total	\$ 260,000		\$26.00
Current period costs:			
Direct materials	\$ 350,000	50,000	\$ 7.00
Direct labor	810,000	50,000	16.20
Variable factory overhead	90,000	50,000	1.80
Fixed factory overhead	100,000	50,000	2.00
Total	\$1,350,000		\$27.00
Selling and administrative expenses:			
Variable	\$ 65,000		
Fixed	45,000		
Total	\$ 110,000		

#### Instructions

- 1. Prepare an income statement based on the absorption costing concept.
- 2. Prepare an income statement based on the variable costing concept.
- 3. Give the reason for the difference in the amount of income from operations in parts (1) and (2).

#### Solution

1.

ì		
	Absorption Costing Income Statement	
	Sales (60,000 × \$30)	\$1,800,000
	Beginning inventory (10,000 × \$26)       \$ 260,000         Cost of goods manufactured (50,000 × \$27)       1,350,000	
	Cost of goods sold	1,610,000
	Gross profit	\$ 190,000
	Selling and administrative expenses (\$65,000 + \$45,000)	110,000
	Income from operations	\$ 80,000

2.

Variable Costing Income Statement		
Sales (60,000 $\times$ \$30)	\$ 240,000	\$1,800,000
Variable cost of goods manufactured (50,000 × \$25)	1,250,000	1,490,000 \$ 310,000
Variable selling and administrative expenses		\$ 245,000
Fixed manufacturing costs	\$ 100,000 <u>45,000</u>	145,000 \$ 100,000

3. The difference of \$20,000 (\$100,000 - \$80,000) in the amount of income from operations is attributable to the different treatment of the fixed manufacturing costs. The beginning inventory in the absorption costing income statement includes \$20,000 (10,000 units × \$2) of fixed manufacturing costs incurred in the preceding period. This \$20,000 was included as an expense in a variable costing income statement of a prior period. Therefore, none of it is included as an expense in the current period variable costing income statement.

## **Discussion Questions**

- 1. What types of costs are customarily included in the cost of manufactured products under (a) the absorption costing concept and (b) the variable costing concept?
- 2. Which type of manufacturing cost (direct materials, direct labor, variable factory overhead, fixed factory overhead) is included in the cost of goods manufactured under the absorption costing concept but is excluded from the cost of goods manufactured under the variable costing concept?
- 3. Which of the following costs would be included in the cost of a manufactured product according to the variable costing concept: (a) rent on factory building, (b) direct materials, (c) property taxes on factory building, (d) electricity purchased to operate factory equipment, (e) salary of factory supervisor, (f) depreciation on factory building, (g) direct labor?
- 4. In the variable costing income statement, how are the fixed manufacturing costs reported, and how are the fixed selling and administrative expenses reported?

- 5. Since all costs of operating a business are controllable, what is the significance of the term *noncontrollable cost*?
- 6. Discuss how financial data prepared on the basis of variable costing can assist management in the development of short-run pricing policies.
- 7. Why might management analyze product profitability?
- 8. Explain why rewarding sales personnel on the basis of total sales might not be in the best interests of a business whose goal is to maximize profits.
- 9. Discuss the two factors affecting both sales and variable costs to which a change in contribution margin can be attributed.
- 10. How is the quantity factor for an increase or a decrease in the amount of sales computed in using contribution margin analysis?
- 11. Explain why service companies use different activity bases than manufacturing companies to classify costs as fixed or variable.

## **Practice Exercises**

#### **EE 20-1** p. 937

#### PE 20-1A Variable costing

OBJ. 1



Light Company has the following information for January:

Sales	\$648,000
Variable cost of goods sold	233,200
Fixed manufacturing costs	155,500
Variable selling and administrative expenses	51,800
Fixed selling and administrative expenses	36,800

Determine (a) the manufacturing margin, (b) the contribution margin, and (c) income from operations for Light Company for the month of January.

#### **EE 20-1** *p. 937*

#### PE 20-1B Variable costing

OBJ. 1



Marley Company has the following information for March:

Sales	\$912,000
Variable cost of goods sold	474,000
Fixed manufacturing costs	82,000
Variable selling and administrative expenses	238,100
Fixed selling and administrative expenses	54,700

Determine (a) the manufacturing margin, (b) the contribution margin, and (c) income from operations for Marley Company for the month of March.

#### **EE 20-2** *p. 938*

#### PE 20-2A Variable costing—production exceeds sales

OBJ. 1

Fixed manufacturing costs are \$60 per unit, and variable manufacturing costs are \$150 per unit. Production was 453,000 units, while sales were 426,000 units. Determine (a) whether variable costing income from operations is less than or greater than absorption costing income from operations, and (b) the difference in variable costing and absorption costing income from operations.



#### **EE 20-2** p. 938

#### PE 20-2B Variable costing—production exceeds sales

OBJ. 1

Fixed manufacturing costs are \$44 per unit, and variable manufacturing costs are \$100 per unit. Production was 67,200 units, while sales were 50,400 units. Determine (a) whether variable costing income from operations is less than or greater than absorption costing income from operations, and (b) the difference in variable costing and absorption costing income from operations.



SHOW ME HOW

#### **EE 20-3** *p. 939*

#### PE 20-3A Variable costing—sales exceed production

OBJ. 1

The beginning inventory is 11,600 units. All of the units that were manufactured during the period and 11,600 units of the beginning inventory were sold. The beginning inventory fixed manufacturing costs are \$32 per unit, and variable manufacturing costs are \$72 per unit. Determine (a) whether variable costing income from operations is less than or greater than absorption costing income from operations, and (b) the difference in variable costing and absorption costing income from operations.



ME HOW

#### **EE 20-3** p. 939

#### PE 20-3B Variable costing—sales exceed production

OBJ. 1

The beginning inventory is 52,800 units. All of the units that were manufactured during the period and 52,800 units of the beginning inventory were sold. The beginning inventory

(Continued)



fixed manufacturing costs are \$14.70 per unit, and variable manufacturing costs are \$30 per unit. Determine (a) whether variable costing income from operations is less than or greater than absorption costing income from operations, and (b) the difference in variable costing and absorption costing income from operations.

#### **EE 20-4** p. 943

#### **PE 20-4A** Analyzing income under absorption and variable costing

OBJ. 2

Variable manufacturing costs are \$13 per unit, and fixed manufacturing costs are \$75,000. Sales are estimated to be 12,000 units.

- a. How much would absorption costing income from operations differ between a plan to produce 12,000 units and a plan to produce 15,000 units?
- b. How much would variable costing income from operations differ between the two production plans?

#### **EE 20-4** p. 943

#### PE 20-4B Analyzing income under absorption and variable costing

OBJ. 2

Variable manufacturing costs are \$126 per unit, and fixed manufacturing costs are \$157,500. Sales are estimated to be 10,000 units.

- a. How much would absorption costing income from operations differ between a plan to produce 10,000 units and a plan to produce 15,000 units?
- b. How much would variable costing income from operations differ between the two production plans?

#### **EE 20-5** *p. 948*

#### PE 20-5A Contribution margin by segment

OBJ. 4

The following information is for Olivio Coaster Bikes Inc.:

SHOW ME HOW

	North	South
Sales volume (units):		
Red Dream	50,000	66,000
Blue Marauder	112,000	140,000
Sales price:		
Red Dream	\$480	\$500
Blue Marauder	\$560	\$600
Variable cost per unit:		
Red Dream	\$248	\$248
Blue Marauder	\$260	\$260

Determine the contribution margin for (a) Red Dream and (b) North Region.

#### **EE 20-5** p. 948

#### **PE 20-5B** Contribution margin by segment

OBJ. 4

The following information is for LaPlanche Industries Inc.:

SHOW
ME HOW

	East	West
Sales volume (units):		
Product XX	45,000	38,000
Product YY	60,000	50,000
Sales price:		
Product XX	\$700	\$660
Product YY	\$728	\$720
Variable cost per unit:		
Product XX	\$336	\$336
Product YY	\$360	\$360

Determine the contribution margin for (a) Product YY and (b) West Region.

#### **EE 20-6** p. 951

#### PE 20-6A Contribution margin analysis

OBJ. 5

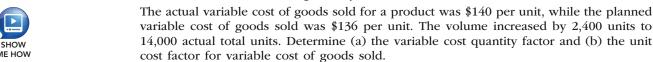


The actual price for a product was \$28 per unit, while the planned price was \$25 per unit. The volume decreased by 20,000 units to 410,000 actual total units. Determine (a) the sales quantity factor and (b) the unit price factor for sales.

#### **EE 20-6** p. 951

#### **PE 20-6B** Contribution margin analysis

OBJ. 5



#### **Exercises**

#### EX 20-1 Inventory valuation under absorption costing and variable costing

OBJ. 1

OBJ, 1

✓ b. Inventory, \$780,800 At the end of the first year of operations, 6,400 units remained in the finished goods inventory. The unit manufacturing costs during the year were as follows:

Direct materials	\$75
Direct labor	35
Fixed factory overhead	15
Variable factory overhead	12

Determine the cost of the finished goods inventory reported on the balance sheet under (a) the absorption costing concept and (b) the variable costing concept.

EX 20-2 Income statements under absorption costing and variable costing

✓ a. Income from operations, \$750,000

Frigid Motors Inc. assembles and sells snowmobile engines. The company began operations on July 1, 2016, and operated at 100% of capacity during the first month. The following data summarize the results for July:



Sales (35,000 units)		\$8,750,000
Production costs (42,500 units):		
Direct materials	\$4,250,000	
Direct labor	2,125,000	
Variable factory overhead	1,062,500	
Fixed factory overhead	637,500	8,075,000
Selling and administrative expenses:		
Variable selling and administrative expenses	\$1,150,000	
Fixed selling and administrative expenses	200,000	1,350,000

- a. Prepare an income statement according to the absorption costing concept.
- b. Prepare an income statement according to the variable costing concept.
- c. What is the reason for the difference in the amount of income from operations reported in (a) and (b)?

#### EX 20-3 Income statements under absorption costing and variable costing

✓ b. Income from operations, \$1,842,000



Bionic Cotton Inc. manufactures and sells high-quality sporting goods equipment under its highly recognizable Cool Cat logo. The company began operations on January 1, 2016, and operated at 100% of capacity (90,000 units) during the first month, creating an ending inventory of 8,000 units. During February, the company produced 82,000 garments during the month but sold 90,000 units at \$100 per unit. The February manufacturing costs and selling and administrative expenses were as follows:

(Continued)

OBJ. 1

	Number of Units	Unit Cost	Total Cost
	Offics	Ollit Cost	Total Cost
Manufacturing costs in February beginning inventory:			
Variable	8,000	\$50	\$ 400,000
Fixed	8,000	_10	80,000
Total		\$60	\$ 480,000
February manufacturing costs:			
Variable	82,000	\$50	\$4,100,000
Fixed	82,000	_12	984,000
Total		\$62	\$5,084,000
Selling and administrative expenses:			
Variable			\$1,350,000
Fixed			324,000
Total			\$1,674,000

- a. Prepare an income statement according to the absorption costing concept for February.
- b. Prepare an income statement according to the variable costing concept for February.
- What is the reason for the difference in the amount of income from operations reported in (a) and (b)?

#### EX 20-4 Cost of goods manufactured, using variable costing and absorption costing

✓ b. Unit cost of goods manufactured, On December 31, the end of the first year of operations, Frankenreiter Inc. manufactured 25,600 units and sold 24,000 units. The following income statement was prepared, based on the variable costing concept:

#### Frankenreiter Inc. **Variable Costing Income Statement** For the Year Ended December 31, 2016

Sales		\$9,600,000
Variable cost of goods sold:		1-,,
Variable cost of goods manufactured	\$5,376,000	
Less inventory, June 30	336,000	
Variable cost of goods sold		5,040,000
Manufacturing margin		\$4,560,000
Variable selling and administrative expenses		1,150,000
Contribution margin		\$3,410,000
Fixed costs:		
Fixed manufacturing costs	\$1,664,000	
Fixed selling and administrative expenses	890,000	2,554,000
Income from operations	·	\$ 856,000

Determine the unit cost of goods manufactured, based on (a) the variable costing concept and (b) the absorption costing concept.

#### **EX 20-5** Variable costing income statement

OBJ, 1

OBJ. 1

On June 30, the end of the first month of operations, Bastile Company prepared the following income statement, based on the absorption costing concept:

#### **Bastile Company Absorption Costing Income Statement** For the Month Ended June 30, 2016

Sales (20,000 units)		\$2,000,000
Cost of goods sold:		
Cost of goods manufactured (24,000 units)	\$1,920,000	
Less inventory, June 30 (4,000 units)	320,000	
Cost of goods sold		1,600,000
Gross profit		\$ 400,000
Selling and administrative expenses		165,000
Income from operations		\$ 235,000

\$275

✓ Income from

operations, \$203,000

If the fixed manufacturing costs were \$192,000 and the variable selling and administrative expenses were \$92,400 prepare an income statement according to the variable costing concept.

#### **EX 20-6** Absorption costing income statement

ORL 1

On July 31, the end of the first month of operations, Del Ray Equipment Company prepared the following income statement, based on the variable costing concept:

#### Del Ray Equipment Company Variable Costing Income Statement For the Month Ended July 31, 2016

Sales (50,000 units)		\$6,250,000
Variable cost of goods sold:		
Variable cost of goods manufactured	\$3,100,000	
Less inventory, July 31 (12,000 units)	600,000	
Variable cost of goods sold		2,500,000
Manufacturing margin		\$3,750,000
Variable selling and administrative expenses		1,575,000
Contribution margin		\$2,175,000
Fixed costs:		
Fixed manufacturing costs	\$ 620,000	
Fixed selling and administrative expenses	487,500	1,107,500
Income from operations		\$1,067,500

Prepare an income statement under absorption costing.

#### EX 20-7 Variable costing income statement

OBJ. 1

The following data were adapted from a recent income statement of **Procter & Gamble Company**:

	(in millions)
Sales	\$84,167
Operating costs:	
Cost of products sold	\$42,428
Marketing, administrative, and other expenses	30,337
Total operating costs	\$72,765
Income from operations	\$11,402

Assume that the variable amount of each category of operating costs is as follows:

	(in millions)
Cost of products sold	\$23,760
Marketing, administrative, and other expenses	12,135

- a. Based on the data given, prepare a variable costing income statement for Procter & Gamble Company, assuming that the company maintained constant inventory levels during the period.
- b. If Procter & Gamble reduced its inventories during the period, what impact would that have on the income from operations determined under absorption costing?

✓ Income from operations, \$1,187,500



✓ a. Income from operations, \$11,402



✓ a. 1. Income from operations, \$136,700 (36,000 units)



#### EX 20-8 Estimated income statements, using absorption and variable costing

Prior to the first month of operations ending July 31, 2016, Muzenski Industries Inc. estimated the following operating results:

Sales (28,800 × \$75)	\$2,160,000
Manufacturing costs (28,800 units):	
Direct materials	1,324,800
Direct labor	316,800
Variable factory overhead	144,000
Fixed factory overhead	216,000
Fixed selling and administrative expenses	29,400
Variable selling and administrative expenses	35,500

The company is evaluating a proposal to manufacture 36,000 units instead of 28,800 units, thus creating an ending inventory of 7,200 units. Manufacturing the additional units will not change sales, unit variable factory overhead costs, total fixed factory overhead cost, or total selling and administrative expenses.

- a. Prepare an estimated income statement, comparing operating results if 28,800 and 36,000 units are manufactured in (1) the absorption costing format and (2) the variable costing format.
- b. What is the reason for the difference in income from operations reported for the two levels of production by the absorption costing income statement?

#### EX 20-9 Variable and absorption costing

**OBJ. 1** 

✓ a. Contribution margin, \$6,263

Ansara Company had the following abbreviated income statement for the year ended December 31, 2016:

	(in millions)
Sales	\$18,769
Cost of goods sold	\$15,471
Selling, administrative, and other expenses	2,049
Total expenses	\$17,520
Income from operations	\$ 1,249

Assume that there were \$3,860 million fixed manufacturing costs and \$1,170 million fixed selling, administrative, and other costs for the year.

The finished goods inventories at the beginning and end of the year from the balance sheet were as follows:

January 1 \$2,354 million December 31 \$2,408 million

Assume that 30% of the beginning and ending inventory consists of fixed costs. Assume work in process and materials inventory were unchanged during the period.

- a. Prepare an income statement according to the variable costing concept for Ansara Company for 2016.
- b. Explain the difference between the amount of income from operations reported under the absorption costing and variable costing concepts.

#### EX 20-10 Variable and absorption costing—three products

OBI 2 3

Happy Feet Inc. manufactures and sells three types of shoes. The income statements prepared under the absorption costing method for the three shoes are as follows:

## Happy Feet Inc. Product Income Statements—Absorption Costing For the Year Ended December 31, 2016

	Cross Training Shoes	Golf Shoes	Running Shoes
Revenues	\$800,000	\$690,000	\$625,000
Cost of goods sold	416,000	338,100	418,750
Gross profit	\$384,000	\$351,900	\$206,250
Selling and administrative expenses	336,000	248,400	350,000
Income from operations	\$ 48,000	\$103,500	\$(143,750)

In addition, you have determined the following information with respect to allocated fixed costs:

	Cross Training	Running		
	Shoes	Golf Shoes	Shoes	
Fixed costs:				
Cost of goods sold	\$128,000	\$89,700	\$118,750	
Selling and administrative expenses	96,000	82,800	118,750	

These fixed costs are used to support all three product lines. In addition, you have determined that the inventory is negligible.

The management of the company has deemed the profit performance of the running shoe line as unacceptable. As a result, it has decided to eliminate the running shoe line. Management does not expect to be able to increase sales in the other two lines. However, as a result of eliminating the running shoe line, management expects the profits of the company to increase by \$143,750.

- a. Do you agree with management's decision and conclusions?
- b. Prepare a variable costing income statement for the three products.
- c. Use the report in (b) to determine the profit impact of eliminating the running shoe line, assuming no other changes.

#### EX 20-11 Change in sales mix and contribution margin

OBJ. 4

Head Pops Inc. manufactures two models of solar powered noise-canceling headphones: Sun Sound and Ear Bling models. The company is operating at less than full capacity. Market research indicates that 28,000 additional Sun Sound and 30,000 additional Ear Bling headphones could be sold. The income from operations by unit of product is as follows:

	Sun Sound Headphone	Ear Bling Headphone
Sales price	\$140.00	\$125.00
Variable cost of goods sold	78.40	70.00
Manufacturing margin	\$ 61.60	\$ 55.00
Variable selling and administrative expenses	28.00	25.00
Contribution margin	\$ 33.60	\$ 30.00
Fixed manufacturing costs	14.00	12.50
Income from operations	\$ 19.60	\$ 17.50

Prepare an analysis indicating the increase or decrease in total profitability if 28,000 additional Sun Sound and 30,000 additional Ear Bling headphones are produced and sold, assuming that there is sufficient capacity for the additional production.

#### **EX 20-12** Product profitability analysis

OBJ. 4

PowerTrain Sports Inc. manufactures and sells two styles of All Terrain Vehicles (ATVs), the Mountain Monster, and Desert Dragon from a single manufacturing facility. The manufacturing facility operates at 100% of capacity. The following per unit information is available for the two products:

(Continued)

✓ a. Desert Dragon contribution margin, \$4,583,250

✓ a. East

\$640,000

contribution margin,

	<b>Mountain Monster</b>	Desert Dragon
Sales price	\$5,400	\$5,250
Variable cost of goods sold	3,285	3,400
Manufacturing margin	\$2,115	\$1,850
Variable selling expenses	1,035	905
Contribution margin	\$1,080	\$ 945
Fixed expenses	485	310
Income from operations	\$ 595	\$ 635

In addition, the following sales unit volume information for the period is as follows:

	Mountain Monster	Desert Dragon
Sales unit volume	5,000	4,850

- a. Prepare a contribution margin by product report. Calculate the contribution margin ratio for each product as a whole percent, rounded to two decimal places.
- b. What advice would you give to the management of PowerTrain Sports Inc. regarding the relative profitability of the two products?

#### **EX 20-13** Territory and product profitability analysis

OBJ. 4

Coast to Coast Surfboards Inc. manufactures and sells two styles of surfboards, Atlantic Wave and Pacific Pounder. These surfboards are sold in two regions, East Coast and West Coast. Information about the two surfboards is as follows:

	<b>Atlantic Waves</b>	<b>Pacific Pounder</b>
Sales price	\$200	\$120
Variable cost of goods sold per unit	150	90
Manufacturing margin per unit	\$ 50	\$ 30
Variable selling expense per unit	34	16
Contribution margin per unit	\$ 16	\$ 14

The sales unit volume for the sales territories and products for the period is as follows:

	East Coast	West Coast
Atlantic Wave	40,000	25,000
Pacific Pounder	0	25,000

- a. Prepare a contribution margin by sales territory report. Calculate the contribution margin ratio for each territory as a whole percent, rounded to two decimal places.
- b. What advice would you give to the management of Coast to Coast Surfboards regarding the relative profitability of the two territories?

#### **EX 20-14** Sales territory and salesperson profitability analysis

OBJ. 4

Reyes Industries Inc. manufactures and sells a variety of commercial vehicles in the North east and South west regions. There are two salespersons assigned to each territory. Higher commission rates go to the most experienced salespersons. The following sales statistics are available for each salesperson:

	North	east	Southwest		
	Cassy G.	Todd	Tim	Jeff	
Average per unit:					
Sales price	\$96,000	\$84,000	\$108,000	\$78,000	
Variable cost of goods sold	57,600	33,600	64,800	31,200	
Commission rate	12%	16%	16%	12%	
Units sold	28	24	24	38	
Manufacturing margin ratio	40%	60%	40%	60%	

✓ a. Todd contribution margin, \$887,040



- a. 1. Prepare a contribution margin by salesperson report. Calculate the contribution margin ratio for each salesperson.
  - 2. Interpret the report.
- b. 1. Prepare a contribution margin by territory report. Calculate the contribution margin for each territory as a percent, rounded to one decimal place.
  - 2. Interpret the report.

#### EX 20-15 Segment profitability analysis

OBJ. 4

✓ a. Electric Power, \$824.92 The marketing segment sales for Caterpillar, Inc., for a recent year follow:



## Caterpillar, Inc. Machinery and Engines Marketing Segment Sales (in millions)

	Building Construction	Cat	Core	Earth-	Electric		Large Power		Marine & Petroleum		
	Products	Japan	Components	moving	Power	Excavation	Systems	Logistics	Power	Mining	Turbines
Sales	\$2,217	\$1,225	\$1,234	\$5,045	\$2,847	\$4,562	\$2,885	\$659	\$2,132	\$3,975	\$3,321

In addition, assume the following information:

	Building Construction	Cat	Core	Earth-	Electric		Large Power		Marine & Petroleum		
	Products	Japan	Components	moving	Power	Excavation	Systems	Logistics	Power	Mining	Turbines
Variable cost of goods sold as a percent of sales	. 45%	55%	49%	51%	54%	52%	53%	50%	50%	52%	48%
Dealer commissions as a percent of sales Variable promotion	. 9%	11%	8%	8%	10%	6%	5%	10%	9%	7%	9%
expenses (in millions)	. 310	120	150	600	200	600	300	75	270	480	400

- a. Use the sales information and the additional assumed information to prepare a contribution margin by segment report. Round to two decimal places. In addition, calculate the contribution margin ratio for each segment as a percentage, rounded to one decimal place.
- b. Prepare a table showing the manufacturing margin, dealer commissions, and variable promotion expenses as a percent of sales for each segment. Round whole percents to one decimal place.
- c. Use the information in (a) and (b) to interpret the segment performance.

#### **EX 20-16** Segment contribution margin analysis

**OBJ. 4, 6** 

The operating revenues of the three largest business segments for Time Warner, Inc., for a recent year follow. Each segment includes a number of businesses, examples of which are indicated in parentheses.

## Q A

✓ a. Filmed

entertainment, 68%

## Time Warner, Inc. Segment Revenues (in millions)

(	
Filmed Entertainment (Warner Bros.)	\$14,204
Networks (CNN, HBO, WB)	12,018
Publishing (Time, People, Sports Illustrated)	3,436

Assume that the variable costs as a percent of sales for each segment are as follows:

Filmed Entertainment 35% Networks 32% Publishing 72%

a. Determine the contribution margin (round to whole millions) and contribution margin ratio (round to whole percents) for each segment from the information given.

(Continued)

- b. Why is the contribution margin ratio for the Publishing segment smaller than for the other segments?
- c. Does your answer to (b) mean that the other segments are more profitable businesses than the Publishing segment?

#### EX 20-17 Contribution margin analysis—sales

OBJ. 5

Buy Best Inc. sells electronic equipment. Management decided early in the year to reduce the price of the speakers in order to increase sales volume. As a result, for the year ended December 31, the sales increased by \$31,875 from the planned level of \$1,048,125. The following information is available from the accounting records for the year ended December 31.

	Actual	Planned	Increase or (Decrease)
Sales	\$1,080,000	\$1,048,125	\$31,875
Number of units sold	36,000	32,250	3,750
Sales price	\$30.00	\$32.50	\$(2.50)
Variable cost per unit	\$10.00	\$10.00	0

- a. Prepare an analysis of the sales quantity and unit price factors.
- b. Did the price decrease generate sufficient volume to result in a net increase in contribution margin if the actual variable cost per unit was \$10, as planned?

#### EX 20-18 Contribution margin analysis—sales

OBJ. 5

Difference-

The following data for Romero Products Inc. are available:

# factor, \$(600,000)

✓ Sales quantity

Actual	Planned	Increase or (Decrease)
\$8,360,000	\$8,200,000	\$160,000
\$3,496,000	\$3,280,000	\$216,000
760,000	902,000	(142,000)
\$4,256,000	\$4,182,000	\$ 74,000
\$4,104,000	\$4,018,000	\$ 86,000
38,000	41,000	
\$220	\$200	
92	80	
20	22	
	\$8,360,000 \$3,496,000 760,000 \$4,256,000 \$4,104,000 38,000 \$220 92	\$8,360,000 \$8,200,000 \$3,496,000 \$3,280,000 760,000 902,000 \$4,256,000 \$4,182,000 \$4,104,000 \$4,018,000 38,000 \$41,000 \$220 \$200 92 80

Prepare an analysis of the sales quantity and unit price factors.

✓ Variable cost of goods sold quantity factor, \$240,000





#### **EX 20-19** Contribution margin analysis—variable costs

OBJ. 5

Based on the data in Exercise 20-18, prepare a contribution analysis of the variable costs for Romero Products Inc. for the year ended December 31.

#### EX 20-20 Variable costing income statement for a service company

**OBJ. 4, 6** 

East Coast Railroad Company transports commodities among three routes (city-pairs): Atlanta/Baltimore, Baltimore/Pittsburgh, and Pittsburgh/Atlanta. Significant costs, their cost behavior, and activity rates for April are as follows:

Cost	Amount	<b>Cost Behavior</b>	<b>Activity Rate</b>
Labor costs for loading and unloading railcars	\$ 175,582	Variable	\$46.00 per railcar
Fuel costs	460,226	Variable	12.40 per train-mile
Train crew labor costs	267,228	Variable	7.20 per train-mile
Switchyard labor costs	118,327	Variable	31.00 per railcar
Track and equipment depreciation	194,400	Fixed	
Maintenance	129,600	Fixed	
	\$1,345,363		

Operating statistics from the management information system reveal the following for April:

	Atlanta/ Baltimore	Baltimore/ Pittsburgh	Pittsburgh/ Atlanta	Total
Number of train-miles	12,835	10,200	14,080	37,115
Number of railcars	425	2,160	1,232	3,817
Revenue per railcar	\$600	\$275	\$440	

- a. Prepare a contribution margin by route report for East Coast Railroad Company for the month of April. Calculate the contribution margin ratio in whole percents, rounded to one decimal place.
- b. Evaluate the route performance of the railroad using the report in (a).





#### EX 20-21 Contribution margin reporting and analysis for a service company OBJ. 5, 6

The management of East Coast Railroad Company introduced in Exercise 20-20 improved the profitability of the Atlanta/Baltimore route in May by reducing the price of a railcar from \$600 to \$500. This price reduction increased the demand for rail services. Thus, the number of railcars increased by 275 railcars to a total of 700 railcars. This was accomplished by increasing the size of each train but not the number of trains. Thus, the number of train-miles was unchanged. All the activity rates remained unchanged.

- a. Prepare a contribution margin report for the Atlanta/Baltimore route for May. Calculate the contribution margin ratio in percentage terms to one decimal place.
- b. Prepare a contribution margin analysis to evaluate management's actions in May. Assume that the May planned quantity, price, and unit cost was the same as April.

## **EX 20-22** Variable costing income statement and contribution margin analysis for a service company OBJ. 5, 6





The actual and planned data for Underwater University for the Fall term 2016 were as follows:

	Actual	Planned
Enrollment	4,500	4,125
Tuition per credit hour	\$120	\$135
Credit hours	60,450	43,200
Registration, records, and marketing cost per enrolled student	\$275	\$275
Instructional costs per credit hour	\$64	\$60
Depreciation on classrooms and equipment	\$825,600	\$825,600

Registration, records, and marketing costs vary by the number of enrolled students, while instructional costs vary by the number of credit hours. Depreciation is a fixed cost.

- a. Prepare a variable costing income statement showing the contribution margin and income from operations for the Fall 2016 term.
- Prepare a contribution margin analysis report comparing planned with actual performance for the Fall 2016 term.

### **Problems: Series A**

✓ 2. Income from operations, \$304,000



#### PR 20-1A Absorption and variable costing income statements

**OBJ. 1, 2** 

During the first month of operations ended May 31, 2016, Frost Point Fridge Company manufactured 40,000 mini refrigerators, of which 36,000 were sold. Operating data for the month are summarized as follows:

Sales		\$6,480,000
Manufacturing costs:		
Direct materials	\$3,200,000	
Direct labor	1,120,000	
Variable manufacturing cost	880,000	
Fixed manufacturing cost	560,000	5,760,000
Selling and administrative expenses:		
Variable	\$ 648,000	
Fixed	288,000	936,000

#### **Instructions**

- 1. Prepare an income statement based on the absorption costing concept.
- 2. Prepare an income statement based on the variable costing concept.
- 3. Explain the reason for the difference in the amount of income from operations reported in (1) and (2).

✓ 2. Contribution margin, \$92,800

#### PR 20-2A Income statements under absorption costing and variable costing OBJ. 1,

The demand for solvent, one of numerous products manufactured by Mac n' Cheese Industries Inc., has dropped sharply because of recent competition from a similar product. The company's chemists are currently completing tests of various new formulas, and it is anticipated that the manufacture of a superior product can be started on June 1, one month in the future. No changes will be needed in the present production facilities to manufacture the new product because only the mixture of the various materials will be changed.

The controller has been asked by the president of the company for advice on whether to continue production during May or to suspend the manufacture of solvent until June 1. The controller has assembled the following pertinent data:

#### Mac n' Cheese Industries Inc. Income Statement—Solvent For the Month Ended April 30, 2016

Sales (4,000 units)	\$500,000
Cost of goods sold	424,000
Gross profit	\$ 76,000
Selling and administrative expenses	102,000
Loss from operations	\$ (26,000)

The production costs and selling and administrative expenses, based on production of 4,000 units in April, are as follows:

Direct materials	\$45 per unit
Direct labor	20 per unit
Variable manufacturing cost	16 per unit
Variable selling and administrative expenses	15 per unit
Fixed manufacturing cost	\$100,000 for April
Fixed selling and administrative expenses	42,000 for April

Sales for May are expected to drop about 20% below those of the preceding month. No significant changes are anticipated in the fixed costs or variable costs per unit. No extra costs will be incurred in discontinuing operations in the portion of the plant associated with solvent. The inventory of solvent at the beginning and end of May is expected to be inconsequential.

#### **Instructions**

- 1. Prepare an estimated income statement in absorption costing form for May for solvent, assuming that production continues during the month. Round amounts to two decimals.
- Prepare an estimated income statement in variable costing form for May for solvent, assuming that production continues during the month. Round amounts to two decimals.
- 3. What would be the estimated loss in income from operations if the solvent production were temporarily suspended for May?
- 4. What advice should the controller give to management?

## PR 20-3A Absorption and variable costing income statements for two months OBJ. 1, 2 and analysis

During the first month of operations ended March 31, 2016, Hip and Conscious Clothing Company produced 55,500 designer cowboy hats, of which 51,450 were sold. Operating data for the month are summarized as follows:

Sales		\$771,750
Manufacturing costs:		
Direct materials	\$471,750	
Direct labor	127,650	
Variable manufacturing cost	61,050	
Fixed manufacturing cost	55,500	715,950
Selling and administrative expenses:		
Variable	\$ 36,015	
Fixed	25,725	61,740

During April, Hip and Conscious Clothing produced 47,400 designer cowboy hats and sold 51,450 cowboy hats. Operating data for April are summarized as follows:

Sales		\$771,750
Manufacturing costs:		
Direct materials	\$402,900	
Direct labor	109,020	
Variable manufacturing cost	52,140	
Fixed manufacturing cost	55,500	619,560
Selling and administrative expenses:		
Variable	\$ 36,015	
Fixed	25,725	61,740

#### **Instructions**

- 1. Using the absorption costing concept, prepare income statements for (a) March and (b) April.
- 2. Using the variable costing concept, prepare income statements for (a) March and (b) April.
- 3. a. Explain the reason for the differences in the amount of income from operations in (1) and (2) for March.
  - b. Explain the reason for the differences in the amount of income from operations in (1) and (2) for April.
- 4. Based on your answers to (1) and (2), did Hip and Conscious Clothing Company operate more profitably in March or in April? Explain.

✓ 1. b. Income from operations, \$38,205



#### PR 20-4A Salespersons' report and analysis

OBJ. 4

✓ 1. Dix contribution margin ratio, 44%

Walthman Industries Inc. employs seven salespersons to sell and distribute its product throughout the state. Data taken from reports received from the salespersons during the year ended December 31 are as follows:

Total Sales	Variable Cost of Goods Sold	Variable Selling Expenses
\$610,000	\$268,400	\$109,800
603,000	241,200	96,480
588,000	305,760	105,840
586,000	281,280	123,060
616,000	221,760	86,240
620,000	310,000	124,000
592,000	272,320	88,800
	\$ales \$610,000 603,000 588,000 586,000 616,000 620,000	Sales         of Goods Sold           \$610,000         \$268,400           603,000         241,200           588,000         305,760           586,000         281,280           616,000         221,760           620,000         310,000

#### **Instructions**

- 1. Prepare a table indicating contribution margin, variable cost of goods sold as a percent of sales, variable selling expenses as a percent of sales, and contribution margin ratio by salesperson. Round whole percents to a single digit.
- 2. Which salesperson generated the highest contribution margin ratio for the year and why?
- 3. Briefly list factors other than contribution margin that should be considered in evaluating the performance of salespersons.

## PR 20-5A Segment variable costing income statement and effect on income of change in operations

Valdespin Company manufactures three sizes of camping tents—small (S), medium (M), and large (L). The income statement has consistently indicated a net loss for the M size, and management is considering three proposals: (1) continue Size M, (2) discontinue Size M and reduce total output accordingly, or (3) discontinue Size M and conduct an advertising campaign to expand the sales of Size S so that the entire plant capacity can continue to be used.

If Proposal 2 is selected and Size M is discontinued and production curtailed, the annual fixed production costs and fixed operating expenses could be reduced by \$46,080 and \$32,240 respectively. If Proposal 3 is selected, it is anticipated that an additional annual expenditure of \$34,560 for the rental of additional warehouse space would yield an additional 130% in Size S sales volume. It is also assumed that the increased production of Size S would utilize the plant facilities released by the discontinuance of Size M.

The sales and costs have been relatively stable over the past few years, and they are expected to remain so for the foreseeable future. The income statement for the past year ended June 30, 2016, is as follows:

	Size			
	S	М	L	Total
Sales	\$668,000	\$737,300	\$ 956,160	\$2,361,460
Cost of goods sold:				
Variable costs	\$300,000	\$357,120	\$437,760	\$1,094,880
Fixed costs	74,880	138,250	172,800	385,930
Total cost of goods sold	\$374,880	\$495,370	\$ 610,560	\$1,480,810
Gross profit	\$293,120	\$241,930	\$ 345,600	\$ 880,650
Less operating expenses:				
Variable expenses	\$132,480	\$155,500	\$ 195,840	\$ 483,820
Fixed expenses	92,160	103,680	115,200	311,040
Total operating expenses	\$224,640	\$ 259,180	\$ 311,040	\$ 794,860
Income from operations	\$ 68,480	\$ (17,250)	\$ 34,560	\$ 85,790

#### **Instructions**

1. Prepare an income statement for the past year in the variable costing format. Use the following headings:

	Size		
S	М	L	Total

✓ 1. Income from operations, \$85,790



Data for each style should be reported through contribution margin. The fixed costs should be deducted from the total contribution margin, as reported in the "Total" column, to determine income from operations.

- 2. Based on the income statement prepared in (1) and the other data presented, determine the amount by which total annual income from operations would be reduced below its present level if Proposal 2 is accepted.
- 3. Prepare an income statement in the variable costing format, indicating the projected annual income from operations if Proposal 3 is accepted. Use the following headings:

Data for each style should be reported through contribution margin. The fixed costs should be deducted from the total contribution margin as reported in the "Total" column. For purposes of this problem, the expenditure of \$34,560 for the rental of additional warehouse space can be added to the fixed operating expenses.

4. By how much would total annual income increase above its present level if Proposal 3 is accepted? Explain.

#### PR 20-6A Contribution margin analysis

OBJ. 5

Dozier Industries Inc. manufactures only one product. For the year ended December 31, the contribution margin increased by \$38,500 from the planned level of \$1,386,000 The president of Dozier Industries Inc. has expressed some concern about such a small increase and has requested a follow-up report.

The following data have been gathered from the accounting records for the year ended December 31:

	Actual	Planned	Difference— Increase (Decrease)
Sales	\$ 2,772,000	\$ 2,750,000	\$ 22,000
Less:			
Variable cost of goods sold	\$ 1,058,750	\$ 1,122,000	\$(63,250)
Variable selling and administrative expenses	288,750	242,000	46,750
Total	\$1,347,500	\$1,364,000	\$(16,500)
Contribution margin	\$1,424,500	\$1,386,000	\$38,500
Number of units sold	19,250	22,000	
Per unit:			
Sales price	\$144	\$125	
Variable cost of goods sold	55	51	
Variable selling and administrative expenses	15	11	

#### Instructions

- 1. Prepare a contribution margin analysis report for the year ended December 31.
- 2. At a meeting of the board of directors on January 30, the president, after reviewing the contribution margin analysis report, made the following comment:

It looks as if the price increase of \$19 had the effect of decreasing sales volume. However, this was a favorable tradeoff. The variable cost of goods sold was less than planned. Apparently, we are efficiently managing our variable cost of goods sold. However, the variable selling and administrative expenses appear out of control. Let's look into these expenses and get them under control! Also, let's consider increasing the sales price to \$160 and continue this favorable tradeoff between higher price and lower volume.

Do you agree with the president's comment? Explain.

1. Sales quantity factor, \$(343,750)



### **Problems: Series B**

## ✓ 2. Contribution margin, \$666,000



✓ 2. Contribution margin, \$960,000

#### PR 20-1B Absorption and variable costing income statements

OBJ. 1, 2

During the first month of operations ended July 31, 2016, YoSan Inc. manufactured 2,400 flat panel televisions, of which 2,000 were sold. Operating data for the month are summarized as follows:

Sales		\$2,150,000
Manufacturing costs:		
Direct materials	\$960,000	
Direct labor	420,000	
Variable manufacturing cost	156,000	
Fixed manufacturing cost	288,000	1,824,000
Selling and administrative expenses:		
Variable	\$204,000	
Fixed	96,000	300,000

#### **Instructions**

- 1. Prepare an income statement based on the absorption costing concept.
- 2. Prepare an income statement based on the variable costing concept.
- 3. Explain the reason for the difference in the amount of income from operations reported in (1) and (2).

#### PR 20-2B Income statements under absorption costing and variable costing OBJ. 1, 2

The demand for aloe vera hand lotion, one of numerous products manufactured by Smooth Skin Care Products Inc., has dropped sharply because of recent competition from a similar product. The company's chemists are currently completing tests of various new formulas, and it is anticipated that the manufacture of a superior product can be started on December 1, one month in the future. No changes will be needed in the present production facilities to manufacture the new product because only the mixture of the various materials will be changed.

The controller has been asked by the president of the company for advice on whether to continue production during November or to suspend the manufacture of aloe vera hand lotion until December 1. The controller has assembled the following pertinent data:

## Smooth Skin Care Products Inc. Income Statement—Aloe Vera Hand Lotion For the Month Ended October 31, 2016

Sales (400,000 units)	\$32,000,000
Cost of goods sold	28,330,000
Gross profit	\$ 3,670,000
Selling and administrative expenses	4,270,000
Loss from operations	\$ (600,000)

The production costs and selling and administrative expenses, based on production of 400,000 units in October, are as follows:

Direct materials \$15 per unit

Direct labor 17 per unit

Variable manufacturing cost 35 per unit

Variable selling and administrative expenses 10 per unit

Fixed manufacturing cost \$1,530,000 for October

Fixed selling and administrative expenses 270,000 for October

Sales for November are expected to drop about 20% below those of the preceding month. No significant changes are anticipated in the fixed costs or variable costs per unit. No extra costs will be incurred in discontinuing operations in the portion of the plant associated with aloe vera hand lotion. The inventory of aloe vera hand lotion at the beginning and end of November is expected to be inconsequential.

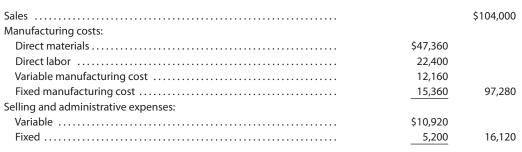
#### **Instructions**

1. Prepare an estimated income statement in absorption costing form for November for aloe vera hand lotion, assuming that production continues during the month.

- 2. Prepare an estimated income statement in variable costing form for November for aloe vera hand lotion, assuming that production continues during the month.
- 3. What would be the estimated loss in income from operations if the aloe vera hand lotion production were temporarily suspended for November?
- 4. What advice should the controller give to management?

# PR 20-3B Absorption and variable costing income statements for two months OBJ. 1, 2 and analysis

During the first month of operations ended July 31, 2016, Head Gear Inc. manufactured 6,400 hats, of which 5,200 were sold. Operating data for the month are summarized as follows:



During August Head Gear Inc. manufactured 4,000 hats and sold 5,200 hats. Operating data for August are summarized as follows:

Sales		\$104,000
Manufacturing costs:		
Direct materials	\$29,600	
Direct labor	14,000	
Variable manufacturing cost	7,600	
Fixed manufacturing cost	15,360	66,560
Selling and administrative expenses:		
Variable	\$10,920	
Fixed	5,200	16,120

## Instructions

- 1. Using the absorption costing concept, prepare income statements for (a) July and (b) August.
- 2. Using the variable costing concept, prepare income statements for (a) July and (b) August.
- 3. a. Explain the reason for the differences in the amount of income from operations in (1) and (2) for July.
  - b. Explain the reason for the differences in the amount of income from operations in (1) and (2) for August.
- 4. Based on your answers to (1) and (2), did Head Gear Inc. operate more profitably in July or in August? Explain.

## PR 20-4B Salespersons' report and analysis

OBJ. 4

Variable

Pachec Inc. employs seven salespersons to sell and distribute its product throughout the state. Data taken from reports received from the salespersons during the year ended June 30 are as follows:

Salesperson	Total Sales	Variable Cost of Goods Sold	Selling Expenses
Asarenka	\$437,500	\$196,875	\$ 83,125
Crowell	570,000	228,000	91,200
Dempster	675,000	310,500	141,750
MacLean	587,500	246,750	123,375
Ortiz	525,000	215,250	126,000
Sullivan	587,500	246,750	99,875
Williams	575,000	253,000	115,000

(Continued)

✓ 2. a. Manufacturing margin, \$37,440



✓ 1. Crowell contribution margin ratio, 44%

#### **Instructions**

- 1. Prepare a table indicating contribution margin, variable cost of goods sold as a percent of sales, variable selling expenses as a percent of sales, and contribution margin ratio by salesperson. (Round whole percent to one digit after decimal point.)
- 2. Which salesperson generated the highest contribution margin ratio for the year and why?
- Briefly list factors other than contribution margin that should be considered in evaluating the performance of salespersons.

## PR 20-5B Variable costing income statement and effect on income of change in operations

✓ 3. Income from operations, \$106,820



Kimbrell Inc. manufactures three sizes of utility tables—small (S), medium (M), and large (L). The income statement has consistently indicated a net loss for the M size, and management is considering three proposals: (1) continue Size M, (2) discontinue Size M and reduce total output accordingly, or (3) discontinue Size M and conduct an advertising campaign to expand the sales of Size S so that the entire plant capacity can continue to be used.

If Proposal 2 is selected and Size M is discontinued and production curtailed, the annual fixed production costs and fixed operating expenses could be reduced by \$142,500 and \$28,350, respectively. If Proposal 3 is selected, it is anticipated that an additional annual expenditure of \$85,050 for the salary of an assistant brand manager (classified as a fixed operating expense) would yield an additional 130% in Size S sales volume. It is also assumed that the increased production of Size S would utilize the plant facilities released by the discontinuance of Size M.

The sales and costs have been relatively stable over the past few years, and they are expected to remain so for the foreseeable future. The income statement for the past year ended December 31, 2016, is as follows:

	Size			
	S	М	L	Total
Sales	\$ 990,000	\$1,087,500	\$945,000	\$3,022,500
Cost of goods sold:				
Variable costs	\$538,500	\$ 718,500	\$567,000	\$1,824,000
Fixed costs	241,000	288,000	250,000	779,000
Total cost of goods sold	\$ 779,500	\$1,006,500	\$817,000	\$2,603,000
Gross profit	\$ 210,500	\$ 81,000	\$128,000	\$ 419,500
Less operating expenses:				
Variable expenses	\$118,100	\$ 108,750	\$ 85,050	\$ 311,900
Fixed expenses	32,125	42,525	14,250	88,900
Total operating expenses	\$150,225	\$ 151,275	\$ 99,300	\$ 400,800
Income from operations	\$ 60,275	\$ (70,275)	\$ 28,700	\$ 18,700

## **Instructions**

1. Prepare an income statement for the past year in the variable costing format. Use the following headings:

Size			
S	М	L	Total

Data for each style should be reported through contribution margin. The fixed costs should be deducted from the total contribution margin, as reported in the "Total" column, to determine income from operations.

- 2. Based on the income statement prepared in (1) and the other data presented above, determine the amount by which total annual income from operations would be reduced below its present level if Proposal 2 is accepted.
- 3. Prepare an income statement in the variable costing format, indicating the projected annual income from operations if Proposal 3 is accepted. Use the following headings:

	Size		
S		L	Total

Data for each style should be reported through contribution margin. The fixed costs should be deducted from the total contribution margin as reported in the "Total" column. For purposes of this problem, the additional expenditure of \$85,050 for the assistant brand manager's salary can be added to the fixed operating expenses.

4. By how much would total annual income increase above its present level if Proposal 3 is accepted? Explain.

#### PR 20-6B Contribution margin analysis

OBJ. 5

Mathews Company manufactures only one product. For the year ended December 31, the contribution margin decreased by \$126,000 from the planned level of \$540,000. The president of Mathews Company has expressed some concern about this decrease and has requested a follow-up report.

The following data have been gathered from the accounting records for the year ended December 31:

			Difference— Increase or
	Actual	Planned	(Decrease)
Sales	\$ 2,277,000	\$2,070,000	\$207,000
Less:			
Variable cost of goods sold	\$1,035,000	\$ 990,000	\$ 45,000
Variable selling and administrative expenses	828,000	540,000	288,000
Total	\$1,863,000	\$1,530,000	\$333,000
Contribution margin	\$ 414,000	\$ 540,000	\$(126,000)
Number of units sold	34,500	30,000	
Per unit:			
Sales price	\$66	\$69	
Variable cost of goods sold	30	33	
Variable selling and administrative expenses	24	18	

#### **Instructions**

- 1. Prepare a contribution margin analysis report for the year ended December 31.
- 2. At a meeting of the board of directors on January 30, the president, after reviewing the contribution margin analysis report, made the following comment:

It looks as if the price decrease of \$3.00 had the effect of increasing sales. However, we lost control over the variable cost of goods sold and variable selling and administrative expenses. Let's look into these expenses and get them under control! Also, let's consider decreasing the sales price to \$60 to increase sales further.

Do you agree with the president's comment? Explain.

## **Cases & Projects**



✓ 1. Sales quantity factor, \$310,500

## CP 20-1 Ethics and professional conduct in business

The Southwest Division of Texcaliber Inc. uses absorption costing for profit reporting. The general manager of the Southwest Division is concerned about meeting the income objectives of the division. At the beginning of the reporting period, the division had an adequate supply of inventory. The general manager has decided to increase production of goods in the plant in order to allocate fixed manufacturing cost over a greater number of units. Unfortunately, the increased production cannot be sold and will increase the inventory. However, the impact on earnings will be positive because the lower cost per unit will be matched against sales. The general manager has come to Aston Melon, the controller, to determine exactly how much additional production is required in order to increase net income enough to meet the division's profit objectives. Aston analyzes the data and determines that the inventory will need to be increased by 30% in order to absorb enough fixed costs and meet the income objective. Aston reports this information to the division manager.

Discuss whether Aston is acting in an ethical manner.

#### CP 20-2 Inventories under absorption costing

BendOR, Inc. manufactures control panels for the electronics industry and has just completed its first year of operations. The following discussion took place between the controller, Gordon Merrick, and the company president, Matt McCray:

*Matt*: I've been looking over our first year's performance by quarters. Our earnings have been increasing each quarter, even though our sales have been flat and our prices and costs have not changed. Why is this?

Gordon: Our actual sales have stayed even throughout the year, but we've been increasing the utilization of our factory every quarter. By keeping our factory utilization high, we will keep our costs down by allocating the fixed plant costs over a greater number of units. Naturally, this causes our cost per unit to be lower than it would be otherwise.

*Matt*: Yes, but what good is this if we have been unable to sell everything that we make? Our inventory is also increasing.

*Gordon:* This is true. However, our unit costs are lower because of the additional production. When these lower costs are matched against sales, it has a positive impact on our earnings.

Matt: Are you saying that we are able to create additional earnings merely by building inventory? Can this be true?

Gordon: Well, I've never thought about it quite that way . . . but I guess so.

*Matt*: And another thing. What will happen if we begin to reduce our production in order to liquidate the inventory? Don't tell me our earnings will go down even though our production effort drops!

Gordon: Well . . .

*Matt*: There must be a better way. I'd like our quarterly income statements to reflect what's really going on. I don't want our income reports to reward building inventory and penalize reducing inventory.

Gordon: I'm not sure what I can do—we have to follow generally accepted accounting principles.

- 1. Why does reporting income under generally accepted accounting principles "reward" building inventory and "penalize" reducing inventory?
- 2. What advice would you give to Gordon in responding to Matt's concern about the present method of profit reporting?

## **CP 20-3** Segmented contribution margin analysis

Bon Jager Inc. manufactures and sells devices used in cardiovascular surgery. The company has two salespersons, Dean and Martin.

A contribution margin by salesperson report was prepared as follows:

## Bon Jager Inc. Contribution Margin by Salesperson

	Dean	Martin
Sales	\$400,000	\$480,000
Variable cost of goods sold	184,000	264,000
Manufacturing margin	216,000	216,000
Variable promotion expenses	72,000	43,200
Variable sales commission expenses	56,000	67,200
	128,000	110,400
Contribution margin	88,000	105,600
Manufacturing margin as a percent of sales		
(manufacturing margin ratio)	54%	45%
Contribution margin ratio	22%	22%

Interpret the report, and provide recommendations to the two salespersons for improving profitability.

#### **CP 20-4** Margin analysis

Jellnick Equipment Inc. manufactures and sells kitchen cooking products throughout the state. The company employs four salespersons. The following contribution margin by salesperson analysis was prepared:

Jellnick Equipment Inc.			
<b>Contribution Margin Analysis by Salesperson</b>			

	Danica	Kyle	Richard	Tom
Sales	\$165,000	\$187,000	\$176,000	\$132,000
Variable cost of goods sold	57,750	93,500	88,000	66,000
Manufacturing margin	\$107,250	\$ 93,500	\$ 88,000	\$ 66,000
Variable selling expenses :				
Commissions	\$ 6,600	\$ 7,480	\$ 7,040	\$ 5,280
Promotion expenses	47,850	44,880	42,240	31,680
Total variable selling expenses	\$ 54,450	\$ 52,360	\$ 49,280	\$ 36,960
Contribution margin	\$ 52,800	\$ 41,140	\$ 38,720	\$ 29,040

- 1. Calculate the manufacturing margin as a percent of sales and the contribution margin ratio for each salesperson.
- 2. Explain the results of the analysis.

#### CP 20-5 Contribution margin analysis

Trans Sport Company sells sporting goods to retailers in three different states—Florida, Georgia, and Tennessee. The following profit analysis by state was prepared by the company:

	Florida	Georgia	Tennessee
Revenue	\$1,125,000	\$1,000,000	\$1,181,250
Cost of goods sold	562,500	535,000	562,500
Gross profit	\$ 562,500	\$ 465,000	\$ 618,750
Selling expenses	365,600	337,500	420,000
Income from operations	\$ 196,900	\$ 127,500	\$ 198,750

The following fixed costs have also been provided:

	Florida	Georgia	Tennessee
Fixed manufacturing costs	\$112,500	\$225,000	\$126,500
Fixed selling expenses	84,375	135,000	113,625

In addition, assume that inventories have been negligible.

Management believes it could increase state sales by 20%, without increasing any of the fixed costs, by spending an additional \$42,200 per state on advertising.

- 1. Prepare a contribution margin by state report for Trans Sport Company.
- 2. Determine how much state operating profit will be generated for an additional \$42,200 per state on advertising.
- 3. Which state will provide the greatest profit return for a \$42,200 increase in advertising? Why?

## CP 20-6 Absorption costing

#### **Group Project**

Craig Company is a family-owned business in which you own 20% of the common stock and your brothers and sisters own the remaining shares. The employment contract of Craig's new president, Ajay Pinder, stipulates a base salary of \$140,000 per year plus 10% of income from operations in excess of \$670,000. Craig uses the absorption costing method of reporting income from operations, which has averaged approximately \$670,000 for the past several years.

Sales for 2016, Pinder's first year as president of Craig Company, are estimated at 44,000 units at a selling price of \$106 per unit. To maximize the use of Craig's productive capacity, Pinder has decided to manufacture 55,000 units, rather than the 44,000 units of estimated sales. The beginning inventory at January 1, 2016, is insignificant in amount, and the manufacturing costs and selling and administrative expenses for the production of 44,000 and 55,000 units are as follows:

(Continued)

#### 44,000 Units to Be Manufactured

	Number	Unit	
	of Units	Cost	Total Cost
Manufacturing costs:			
Variable	44,000	\$50.00	\$2,200,000
Fixed	44,000	11.00	484,000
Total		\$61.00	\$2,684,000
Selling and administrative expenses:			
Variable	\$1,050,000		
Fixed	330,000		
Total	\$1,380,000		

#### 55,000 Units to Be Manufactured

	Number of Units	Unit Cost	Total Cost
Manufacturing costs:			
Variable	55,000	\$50.00	\$2,750,000
Fixed	55,000	8.80	484,000
Total		\$58.80	\$3,234,000
Selling and administrative expenses:			
Variable	\$1,050,000		
Fixed	330,000		
Total	\$1,380,000		

- 1. In one group, prepare an absorption costing income statement for the year ending December 31, 2016, based on sales of 44,000 units and the manufacture of 44,000 units. In the other group, conduct the same analysis, assuming production of 55,000 units.
- 2. Explain the difference in the income from operations reported in (1).
- 3. Compute Pinder's total salary for the year 2016, based on sales of 44,000 units and the manufacture of 44,000 units (Group 1) and 55,000 units (Group 2). Compare your answers.
- 4. In addition to maximizing the use of Craig Company's productive capacity, why might Pinder wish to manufacture 55,000 units rather than 44,000 units?
- 5. Can you suggest an alternative way in which Pinder's salary could be determined, using a base salary of \$140,000 and 10% of income from operations in excess of \$670,000, so that the salary could not be increased by simply manufacturing more units?



# Budgeting

# Hendrick Motorsport

You may have financial goals for your life. To achieve these goals, it is necessary to plan for future expenses. For example, you may consider taking a part-time job to save money for school expenses for the coming school year. How much money would you need to earn and save in order to pay these expenses? One way to find an answer to this question would be to prepare a budget. A budget would show an estimate of your expenses associated with school, such as tuition, fees, and books. In addition, you would have expenses for day-to-day living, such as rent, food, and clothing. You might also have expenses for travel and entertainment. Once the school year begins, you can use the budget as a tool for guiding your spending priorities during the year.

The budget is used in businesses in much the same way it can be used in personal life. For example, **Hendrick Motorsport**, featuring drivers Dale Earnhardt, Jr., Jeff Gordon, and Jimmy Johnson, uses budget information to remain one of the most valuable racing teams in NASCAR. Hendrick uses budgets to keep revenues

greater than expenses. For example, Hendrick plans revenues from car sponsorships and winnings. Primary and secondary sponsorships (car decals) can provide as much as 70% of the revenues for a typical race team. Costs include salaries, engines, tires, cars, travel, and research and development. In addition, star drivers such as Dale Earnhardt, Jr. can earn as much as \$28 million in salary, winnings, and endorsements. Overall, Hendrick is estimated to earn \$179 million in revenues and \$16.6 million in operating income from their four race teams. The budget provides the company with a "game plan" for the year. In this chapter, you will see how budgets can be used for financial planning and control.

Source: Kurt Badenhausen, "Hendrick Motorsports Tops list of Nascar's Most Valuable Teams," Forbes, March 13, 2013. Bob Pockrass, "NASCAR's Highest Paid drivers make their money from a variety of sources," Sporting News, December 4, 2012. Ed Hilton, "Under the Hood at Hendrick Motorsports", Chicago Tribune, July 13, 2007.





## **Nature and Objectives of Budgeting**

**Budgets** play an important role for organizations of all sizes and forms. For example, budgets are used in managing the operations of government agencies, churches, hospitals, and other nonprofit organizations. Individuals and families also use budgeting in managing their financial affairs. This chapter describes and illustrates budgeting for a manufacturing company.

## **Objectives of Budgeting**

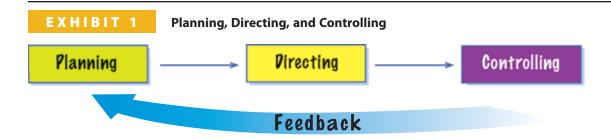
Budgeting involves (1) establishing specific goals, (2) executing plans to achieve the goals, and (3) periodically comparing actual results with the goals. In doing so, budgeting affects the following managerial functions:

- Planning
- Directing
- Controlling

The relationships of these activities are illustrated in Exhibit 1.

*Planning* involves setting goals to guide decisions and help motivate employees. The planning process often identifies where operations can be improved.

*Directing* involves decisions and actions to achieve budgeted goals. A budgetary unit of a company is called a **responsibility center**. Each responsibility center is led by a manager who has the authority and responsibility for achieving the center's budgeted goals.



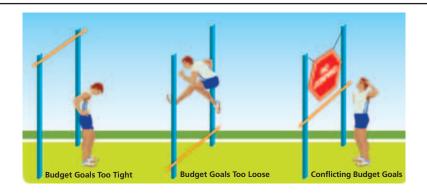
Controlling involves comparing actual performance against the budgeted goals. Such comparisons provide feedback to managers and employees about their performance. If necessary, responsibility centers can use such feedback to adjust their activities in the future.

## **Human Behavior and Budgeting**

Human behavior problems can arise in the budgeting process in the following situations:

- Budgeted goals are set too tight, which are very hard or impossible to achieve.
- Budgeted goals are set too loose, which are very easy to achieve.
- Budgeted goals conflict with the objectives of the company and employees.

These behavior problems are illustrated in Exhibit 2.



**EXHIBIT 2** 

Human Behavior Problems in Budgeting

**Setting Budget Goals Too Tightly** Employees and managers may become discouraged if budgeted goals are set too high. That is, if budgeted goals are viewed as unrealistic or unachievable, the budget may have a negative effect on the ability of the company to achieve its goals.

Reasonable, attainable goals are more likely to motivate employees and managers. For this reason, it is important for employees and managers to be involved in the budgeting process. Involving employees in the budgeting process provides them with a sense of control and, thus, more of a commitment in meeting budgeted goals.

**Setting Budget Goals Too Loosely** Although it is desirable to establish attainable goals, it is undesirable to plan budget goals that are too easy. Such budget "padding" is termed **budgetary slack**. Managers may plan slack in their budgets to provide a "cushion" for unexpected events. However, slack budgets may create inefficiency by reducing the budgetary incentive to trim spending.

**Setting Conflicting Budget Goals** Goal conflict occurs when the employees' or managers' self-interest differs from the company's objectives or goals. To illustrate, assume that the sales department manager is given an increased sales goal and as a result accepts customers who are poor credit risks. Thus, while the sales department might meet sales goals, the overall firm may suffer reduced profitability from bad debts.

## Integrity, Objectivity, and Ethics in Business



#### **BUDGET GAMES**

The budgeting system is designed to plan and control a business. However, it is common for the budget to be "gamed" by its participants. For example, managers may pad their budgets with excess resources. In this way, the managers have additional resources for unexpected events during the period. If the budget is being used to establish the incentive plan, then sales managers have incentives to understate the sales potential of a territory to ensure hitting their quotas. Other times, managers engage in "land grabbing," which occurs

when they overstate the sales potential of a territory to guarantee access to resources. If managers believe that unspent resources will not roll over to future periods, then they may be encouraged to "spend it or lose it," causing wasteful expenditures. These types of problems can be partially overcome by separating the budget into planning and incentive components. This is why many organizations have two budget processes, one for resource planning and another, more challenging budget, for motivating managers.

Describe the basic elements of the budget process, the two major types of budgeting, and the use of computers in budgeting.

## **Budgeting Systems**

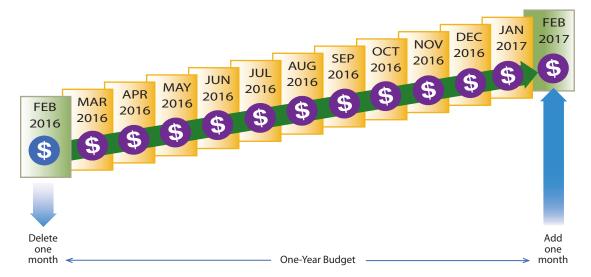
Budgeting systems vary among companies and industries. For example, the budget system used by Ford Motor Company differs from that used by Delta Air Lines. However, the basic budgeting concepts discussed in this section apply to all types of businesses and organizations.

The budgetary period for operating activities normally includes the fiscal year of a company. A year is short enough that future operations can be estimated fairly accurately, yet long enough that the future can be viewed in a broad context. However, for control purposes, annual budgets are usually subdivided into shorter time periods, such as quarters of the year, months, or weeks.

A variation of fiscal-year budgeting, called **continuous budgeting**, maintains a 12-month projection into the future. The 12-month budget is continually revised by replacing the data for the month just ended with the budget data for the same month in the next year. A continuous budget is illustrated in Exhibit 3.

## **EXHIBIT 3**

#### **Continuous Budgeting**



Developing an annual budget usually begins several months prior to the end of the current year. This responsibility is normally assigned to a budget committee. Such a committee often consists of the budget director, the controller, the treasurer, the production manager, and the sales manager. The budget process is monitored and summarized by the Accounting Department, which reports to the committee.

There are several methods of developing budget estimates. One method, called **zero-based budgeting**, requires managers to estimate sales, production, and other operating data as though operations are being started for the first time. This approach has the benefit of taking a fresh view of operations each year. A more common approach is to start with last year's budget and revise it for actual results and expected changes for the coming year. Two major budgets using this approach are the static budget and the flexible budget.

## **Static Budget**

A static budget shows the expected results of a responsibility center for only one activity level. Once the budget has been determined, it is not changed, even if the activity changes. Static budgeting is used by many service companies, governmental entities, and for some functions of manufacturing companies, such as purchasing, engineering, and accounting.



To illustrate, the static budget for the Assembly Department of Colter Manufacturing Company is shown in Exhibit 4.

	А	В		
1	Colter Manufacturing Company			
2	Assembly Department Budget			
3	For the Year Ending July 31, 2016			
4	Direct labor	\$40,000		
5	Electric power	5,000		
6	Supervisor salaries			
7	Total department costs			

EXHIBIT 4

**Static Budget** 

A disadvantage of static budgets is that they do not adjust for changes in activity levels. For example, assume that the Assembly Department of Colter Manufacturing spent \$70,800 for the year ended July 31, 2016. Thus, the Assembly Department spent \$10,800 (\$70,800 – \$60,000), or 18% (\$10,800 ÷ \$60,000) more than budgeted. Is this good news or bad news?

The first reaction is that this is bad news and the Assembly Department was inefficient in spending more than budgeted. However, assume that the Assembly Department's budget was based on plans to assemble 8,000 units during the year. If 10,000 units were actually assembled, the additional \$10,800 spent in excess of budget might be good news. That is, the Assembly Department assembled 25% (2,000 units  $\div$  8,000 units) more than planned for only 18% more cost. In this case, a static budget may not be useful for controlling costs.

# Service Focus

## **FILM BUDGETING**

Service businesses, like film and entertainment, use budgets as a roadmap to control expenses. In film production, the budget is a valuable tool to manage the tension between creative expression and cost.

The film budget is a static budget that can be divided into three major categories:

- above the line
- below the line
- post-production costs

The above the line costs include costs attributed to creative talent, such as the lead cast's and director's salaries

and script fees. The *below the line* costs include the remaining costs to create the film, including location, costume, and prop rentals; permits; and other production costs. The *post-production costs* include the costs to complete the film, including editing, sound, and special effects. Marketing has a separate budget.

The total cost of the film is influenced by many decisions, including the cost of story rights, location, star quality of creative talent, union representation in the production crew, music, and special effects. Even a low-budget Indie (independent) documentary could easily have a budget of more than \$1 million. In contrast, a special effect-laden Hollywood film could have a budget in excess of \$200 million.

## **Flexible Budget**

#### Note:

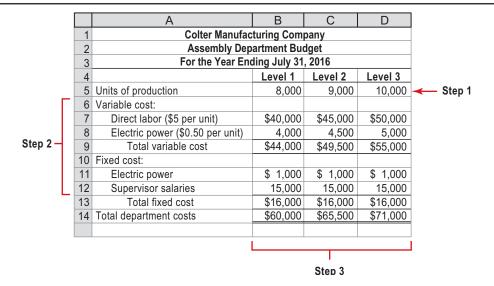
Flexible budgets show expected results for several activity levels.

Unlike static budgets, **flexible budgets** show the expected results of a responsibility center for several activity levels. A flexible budget is, in effect, a series of static budgets for different levels of activity.

To illustrate, a flexible budget for the Assembly Department of Colter Manufacturing Company is shown in Exhibit 5.

## **EXHIBIT 5**

Flexible Budget



A flexible budget is constructed as follows:

- Step 1. Identify the relevant activity levels. The relevant levels of activity could be expressed in units, machine hours, direct labor hours, or some other activity base. In Exhibit 5, the levels of activity are 8,000, 9,000, and 10,000 units of production.
- Step 2. Identify the fixed and variable cost components of the costs being budgeted. In Exhibit 5, the electric power cost is separated into its fixed cost (\$1,000 per year) and variable cost (\$0.50 per unit). The direct labor is a variable cost, and the supervisor salaries are all fixed costs.
- Step 3. Prepare the budget for each activity level by multiplying the variable cost per unit by the activity level and then adding the monthly fixed cost.

With a flexible budget, actual costs can be compared to the budgeted costs for actual activity. To illustrate, assume that the Assembly Department spent \$70,800 to produce 10,000 units. Exhibit 5 indicates that the Assembly Department was *under* budget by \$200 (\$71,000 – \$70,800).

Under the static budget in Exhibit 4, the Assembly Department was \$10,800 over budget. This comparison is illustrated in Exhibit 6.

The flexible budget for the Assembly Department is much more accurate and useful than the static budget. This is because the flexible budget adjusts for changes in the level of activity. Flexible budgets can be used in service businesses when the variable costs can be associated to an activity. For example, hospital room expenses are related to number of patients, or transportation fuel costs are related to number of miles.



## **EXHIBIT 6**

## Static and Flexible Budgets





## Example Exercise 21-1 Flexible Budgeting

OBJ 2

At the beginning of the period, the Assembly Department budgeted direct labor of \$45,000 and supervisor salaries of \$30,000 for 5,000 hours of production. The department actually completed 6,000 hours of production. Determine the budget for the department, assuming that it uses flexible budgeting.

## Follow My Example 21-1

Variable cost:

Fixed cost:

 Supervisor salaries.
 30,000

 Total department costs
 \$84,000

*\$45,000 ÷ 5,000 hours

Practice Exercises: PE 21-1A, PE 21-1B

## **Computerized Budgeting Systems**

In developing budgets, companies use a variety of computerized approaches. Two of the most popular computerized approaches use:

- Spreadsheet software such as Microsoft Excel
- Integrated budget and planning (B&P) software systems

Spreadsheets ease budget preparation by summarizing budget information in linked spreadsheets across the organization. In addition, the impact of proposed changes in various assumptions or operating alternatives can be analyzed on a spreadsheet.

10-15 days.



B&P software systems use the Web (Intranet) to link thousands of employees together during the budget process. Employees can input budget data onto Web pages that are integrated and summarized throughout the company. In this way, a company can quickly and consistently integrate top-level strategies and goals to lower-level operational goals.



# Business 🔀 Connection

#### **BUILD VERSUS HARVEST**

Budgeting systems are not "one size fits all" solutions but must adapt to the underlying business conditions. For example, a business can adopt either a build strategy or a harvest strategy. A build strategy is one where the business is designing, launching, and growing new products and markets. Apple, Inc.'s iPad® is an example of a product managed under a build strategy. A harvest strategy is often employed for business units with mature products enjoying high market share in low-growth industries. H.J. Heinz Company's ketchup and P&G's Ivory soap are examples of such products. A build strategy often has greater uncertainty, unpredictability, and change than a harvest

strategy. The difference between these strategies implies different budgeting approaches.

The build strategy should employ a budget approach that is flexible to the uncertainty of the business. Thus, budgets should adapt to changing conditions by allowing periodic revisions and flexible targets. The budget serves as a short-term planning tool to guide management in executing an uncertain and evolving product market strategy.

In a harvest strategy, the business is often much more stable and is managed to maximize profitability and cash flow. Because cost control is much more important in this strategy, the budget is used to restrict the actions of managers.

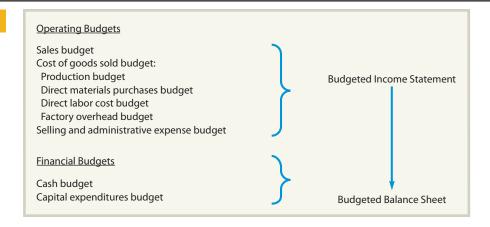


## **Master Budget**

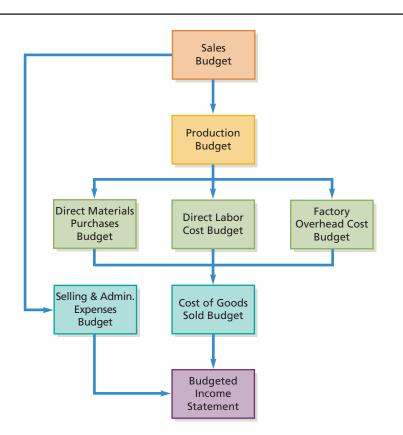
The **master budget** is an integrated set of operating and financial budgets for a period of time. Most companies prepare a master budget on a yearly basis. Exhibit 7 shows that the operating budgets can be used to prepare a budgeted income statement, while the financial budgets provide information for a budgeted balance sheet.

## EXHIBIT 7

**Master Budget for** a Manufacturing Company



The master budget begins with preparing the operating budgets, which form the budgeted income statement. Exhibit 8 shows the relationships among the operating budgets leading to an income statement budget.



## **EXHIBIT 8**

**Operating Budgets** 

## **Operating Budgets**

The integrated operating budgets that support the income statement budget are illustrated for **Elite Accessories Inc.**, a small manufacturing company of personal accessories.

# Prepare the basic operating budgets for a manufacturing company.

## **Sales Budget**

The **sales budget** begins by estimating the quantity of sales. The prior year's sales are often used as a starting point. These sales quantities are then revised for such factors as planned advertising and promotion, projected pricing changes, and expected industry and general economic conditions.

Once sales quantities are estimated, the budgeted sales revenue can be determined as follows:

Budgeted Revenue = Expected Sales Volume × Expected Unit Sales Price

To illustrate, **Elite Accessories Inc.** manufactures wallets and handbags that are sold in two regions, the East and West regions. Elite Accessories estimates the following sales volumes and prices for 2016:

	East Region Sales Volume	West Region Sales Volume	Unit Selling Price
Wallets	287,000	241,000	\$12
Handbags	156,400	123,600	25

Exhibit 9 illustrates the sales budget for Elite Accessories based on the preceding data.

## **EXHIBIT 9**

**Sales Budget** 

	A	В	С	D		
1	Elite Accessories Inc.					
2	S	ales Budget				
3	For the Year E	nding Deceml	per 31, 2016			
4		Unit Sales	<b>Unit Selling</b>			
5	Product and Region	Volume	Price	Total Sales		
6	Wallet:					
7	East	287,000	\$12.00	\$ 3,444,000		
8	West	241,000	12.00	2,892,000		
9	Total	528,000		\$ 6,336,000		
10						
11	Handbag:					
12	East	156,400	\$25.00	\$ 3,910,000		
13	West	123,600	25.00	3,090,000		
14	Total	280,000		\$ 7,000,000		
15						
16	Total revenue from sales			\$13,336,000		

## **Production Budget**

The production budget should be integrated with the sales budget to ensure that production and sales are kept in balance during the year. The **production budget** estimates the number of units to be manufactured to meet budgeted sales and desired inventory levels. The budgeted units to be produced are determined as follows:

Expected units to be sold XXX units
Plus desired units in ending inventory + XXX
Less estimated units in beginning inventory
Total units to be produced XXX units

Elite Accessories Inc. expects the following inventories of wallets and handbags:

	Estimated Inventory, January 1, 2016	Desired Inventory, December 31, 2016
Wallets	88,000	80,000
Handbags	48,000	60,000

Exhibit 10 illustrates the production budget for Elite Accessories.

## **EXHIBIT 10**

## **Production Budget**

	A	В	С				
1	Elite Accessories Inc.						
2	Production Budget						
3	3 For the Year Ending December 31, 2016						
4	Units						
5	5 Wallet Handbag						
6	Expected units to be sold (from Exhibit 9)	528,000	280,000				
7	Plus desired ending inventory, December 31, 2016	80,000	60,000				
8	Total	608,000	340,000				
9	Less estimated beginning inventory, January 1, 2016	88,000	48,000				
10	Total units to be produced	520,000	292,000				

## Example Exercise 21-2 Production Budget



Landon Awards Co. projected sales of 45,000 brass plaques for 2016. The estimated January 1, 2016, inventory is 3,000 units, and the desired December 31, 2016, inventory is 5,000 units. What is the budgeted production (in units) for 2016?

Follow My Example 21-2	
Expected units to be sold	45,000
Plus desired ending inventory, December 31, 2016	
Total	
Less estimated beginning inventory, January 1, 2016	3,000
Total units to be produced	47,000
P	ractice Exercises: PE 21-2A, PE 21-2B

## **Direct Materials Purchases Budget**

The direct materials purchases budget should be integrated with the production budget to ensure that production is not interrupted during the year. The **direct materials purchases budget** estimates the quantities of direct materials to be purchased to support budgeted production and desired inventory levels and can be developed in three steps.

**Step 1** Determine the budgeted direct material required for production, which is computed as follows:

```
Budgeted Direct Material = Budgeted Production Volume × Direct Material Quantity
Required for Production (from Exhibit 10) Expected per Unit
```

To illustrate, **Elite Accessories Inc.** uses leather and lining in producing wallets and handbags. The quantity of direct materials expected to be used for each unit of product is as follows:

Wallet	Handbag
Leather: 0.30 sq. yd. per unit	Leather: 1.25 sq. yds. per unit
Lining: 0.10 sq. yd. per unit	Lining: 0.50 sq. yd. per unit

For the wallet, the direct material required for production is computed as follows:

```
Leather: 520,000 units \times 0.30 sq. yd. per unit = 156,000 sq. yds. Lining: 520,000 units \times 0.10 sq. yd. per unit = 52,000 sq. yds.
```

For the handbag, the direct material required for production is computed as follows:

```
Leather: 292,000 units \times 1.25 sq. yd. per unit = 365,000 sq. yds. Lining: 292,000 units \times 0.50 sq. yd. per unit = 146,000 sq. yds.
```

**Step 2** The budgeted material required for production is adjusted for beginning and ending inventories to determine the direct materials to be purchased for each material, as follows:

Materials required for production (Step 1)	XXX
Plus desired ending materials inventory	+XXX
Less estimated beginning materials inventory	-XXX
Direct material quantity to be purchased	XXX

**Step 3** The budgeted direct materials to be purchased is computed as follows:

```
Budgeted Direct Material = Direct Material Quantity to be Purchased \times Unit Price to be Purchased (Step 2)
```

**Complete Direct Materials Purchases Budget** The following inventory and unit price information for **Elite Accessories Inc.** is expected:

	Estimated	Desired
	Direct Materials Inventory,	Direct Materials Inventory,
	January 1, 2016	December 31, 2016
Leather	18,000 sq. yds.	20,000 sq. yds.
Lining	15,000 sq. yds.	12,000 sq. yds.

The estimated price per square yard of leather and lining during 2016 follows:

	Price per Square Yard
Leather	\$4.50
Lining	1.20

Exhibit 11 illustrates the complete direct materials purchases budget for Elite Accessories by combining all three steps into a single schedule.

## **EXHIBIT 11**

Direct Materials
Purchases Budget

		Α	В	С	D	Е
	1	Elite Accessories Inc.				
	2		Direct Materials Purc	hases Budget	t	
	3		For the Year Ending De	cember 31, 20	)16	
	4			Direct M		
	5			Leather	Lining	Total
_	6		yards required for production:			
Step 1. – Step 2. – Step 3. –	7	Wall	et (Note A)	156,000	52,000	
C.OP	8	Han	dbag (Note B)	365,000	-,	
Γ			sired inventory, December 31, 2016	20,000		
Step 2.	10	Tota		541,000	,	
	11		timated inventory, January 1, 2016	18,000		
- - - - - - - - - - - - - - - - - - -	12		I square yards to be purchased	523,000		
Step 3.		Unit prid	ce (per square yard)	× \$4.50		
L	14	Total di	rect materials to be purchased	\$2,353,500	\$234,000	\$2,587,500
	15					
	16	Note A:	Leather: 520,000 units $ imes$ 0.30 sq. yd. $\mu$			
Lining: 520,000 units $\times$ 0.10 sq. yd. per unit = 52,000 sq. yds.				00 sq. yds.		
	18					
	Note B: Leather: 292,000 units $\times$ 1.25 sq. yds. per unit = 365,000 sq. yds.					
	20		Lining: 292,000 units $ imes$ 0.50 sq. yd. pe	er unit = 146,	000 sq. yds.	

The timing of the direct materials purchases should be coordinated between the purchasing and production departments so that production is not interrupted.

## Example Exercise 21-3 Direct Materials Purchases Budget



Landon Awards Co. budgeted production of 47,000 brass plaques in 2016. Brass sheet is required to produce a brass plaque. Assume 96 square inches of brass sheet are required for each brass plaque. The estimated January 1, 2016, brass sheet inventory is 240,000 square inches. The desired December 31, 2016, brass sheet inventory is 200,000 square inches. If brass sheet costs \$0.12 per square inch, determine the direct materials purchases budget for 2016.

## Follow My Example 21-3

Square inches required for production: Brass sheet (47,000 $\times$ 96 sq. in.)	4,512,000
Plus desired ending inventory, December 31, 2016	200,000
Total	4,712,000
Less estimated beginning inventory, January 1, 2016	240,000
Total square inches to be purchased	4,472,000
Unit price (per square inch)	× \$0.12
Total direct materials to be purchased	\$536,640
	_

Practice Exercises: PE 21-3A, PE 21-3B

## **Direct Labor Cost Budget**

The **direct labor cost budget** estimates the direct labor hours and related cost needed to support budgeted production. Production managers study work methods to provide estimates used in preparing the direct labor cost budget.

The direct labor cost budget for each department is determined in two steps, as follows.

**Step 1** Determine the budgeted direct labor hours required for production, which is computed as follows:

Budgeted Direct Labor = Budgeted Production Volume × Direct Labor Hours Expected Hours Required for (from Exhibit 10) per Unit

Production

To illustrate, **Elite Accessories Inc.**'s production managers estimate the following direct labor hours are needed to produce a wallet and handbag:

Wallet	Handbag	
Cutting Department: 0.10 hr. per unit	Cutting Department: 0.15 hr. per unit	
Sewing Department: 0.25 hr. per unit	Sewing Department: 0.40 hr. per unit	

Thus, for the wallet, the budgeted direct labor hours required for production is computed as follows:

Cutting: 520,000 units  $\times$  0.10 hr. per unit = 52,000 direct labor hours Sewing: 520,000 units  $\times$  0.25 hr. per unit = 130,000 direct labor hours

For the handbag, the budgeted direct labor hours required for production is computed as follows:

Cutting: 292,000 units  $\times$  0.15 hr. per unit = 43,800 direct labor hours Sewing: 292,000 units  $\times$  0.40 hr. per unit = 116,800 direct labor hours

**Step 2** Determine the total direct labor cost as follows:

Direct Labor Cost = Direct Labor Required for Production (Step 1) × Hourly Rate

The estimated direct labor hourly rates for the Cutting and Sewing departments for **Elite Accessories**, **Inc.** during 2016 follow:

	Hourly Rate
Cutting Department	\$12
Sewing Department	15

**Complete Direct Labor Cost Budget** Exhibit 12 illustrates the direct labor cost budget by combining both steps for **Elite Accessories Inc.** 

		Α	В	С	D	Е	
	1		Elite Accessories Inc.				
	2		Direct Labor C	ost Budget			
	3		For the Year Ending I	December 31,	2016		
	4			Cutting	Sewing	Total	
	5	Hours re	equired for production:				
Stan 1	6	Wall	et (Note A)	52,000	130,000		
Step 1. –	7	Han	dbag (Note B)	43,800	116,800		
Γ	8	Tota	l	95,800	246,800		
Step 2	9	Hourly r	ate	× \$12.00	× \$15.00		
	10	Total di	rect labor cost	\$1,149,600	\$3,702,000	\$4,851,600	
_	11						
	12	Note A:	Cutting Department: 520,000 units	× 0.10 hr. pe	er unit = 52,0	00 hrs.	
	13		Sewing Department: 520,000 units	imes 0.25 hr. po	er unit = 130,	000 hrs.	
	14						
	15	Note B:	Cutting Department: 292,000 units	× 0.15 hr. pe	er unit = 43,8	00 hrs.	
	16		Sewing Department: 292,000 units	× 0.40 hr. pe	er unit = 116,	800 hrs.	
			-	·			

## **EXHIBIT 12**

Direct Labor Cost Budget Hou

The direct labor needs should be coordinated between the production and personnel departments so that there will be enough labor available for production.

## Example Exercise 21-4 Direct Labor Cost Budget



Landon Awards Co. budgeted production of 47,000 brass plaques in 2016. Each plaque requires engraving. Assume that 12 minutes are required to engrave each plaque. If engraving labor costs \$11.00 per hour, determine the direct labor cost budget for 2016.

## Follow My Example 21-4

Hours required for engraving:

Brass plaque (47,000 × 12 min.)	564,000 min.
Convert minutes to hours	÷ 60 min.
Engraving hours	9,400 hrs.
ırly rate	× \$11.00
al direct labor cost	\$103,400

Practice Exercises: PE 21-4A, PE 21-4B

## **Factory Overhead Cost Budget**

The **factory overhead cost budget** estimates the cost for each item of factory overhead needed to support budgeted production.

Exhibit 13 illustrates the factory overhead cost budget for Elite Accessories Inc.

## EXHIBIT 13

Factory Overhead Cost Budget

	A	В
1	Elite Accessories Inc.	
2	Factory Overhead Cost Budget	
3	For the Year Ending December 31, 2016	
4	Indirect factory wages	\$ 732,800
5	Supervisor salaries	360,000
6	Power and light	306,000
7	Depreciation of plant and equipment	288,000
8	Indirect materials	182,800
9	Maintenance	140,280
10	Insurance and property taxes	79,200
11	Total factory overhead cost	\$2,089,080

The factory overhead cost budget shown in Exhibit 13 may be supported by departmental schedules. Such schedules normally separate factory overhead costs into fixed and variable costs to better enable department managers to monitor and evaluate costs during the year.

The factory overhead cost budget should be integrated with the production budget to ensure that production is not interrupted during the year.

## **Cost of Goods Sold Budget**

The cost of goods sold budget is prepared by integrating the following budgets:

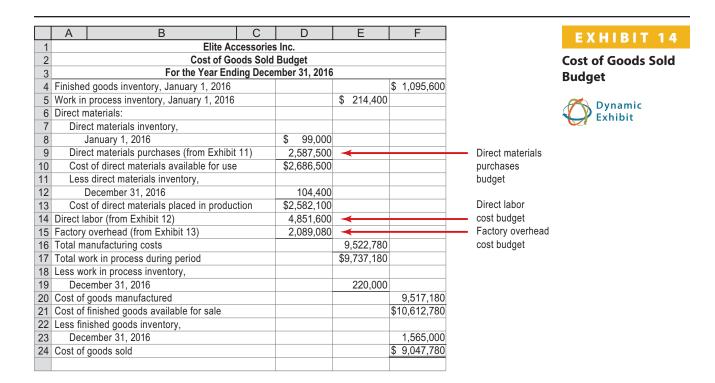
- Direct materials purchases budget (Exhibit 11)
- Direct labor cost budget (Exhibit 12)
- Factory overhead cost budget (Exhibit 13)

In addition, the estimated and desired inventories for direct materials, work in process, and finished goods must be integrated into the cost of goods sold budget.

**Elite Accessories Inc.** expects the following direct materials, work in process, and finished goods inventories:

	Estimated Inventory, January 1, 2016	Desired Inventory, December 31, 2016
Direct materials:		
Leather	\$ 81,000 (18,000 sq. yds. × \$4.50)	\$ 90,000 (20,000 sq. yds. × \$4.50)
Lining	18,000 (15,000 sq. yds. × \$1.20)	14,400 (12,000 sq. yds. × \$1.20)
Total direct		
materials	\$ 99,000	\$ 104,400
Work in process	\$ 214,400	\$ 220,000
Finished goods	\$1,095,600	\$1,565,000

The cost of goods sold budget for Elite Accessories in Exhibit 14 indicates that total manufacturing costs of \$9,522,780 are budgeted to be incurred in 2016. Of this total, \$2,582,100 is budgeted for direct materials, \$4,851,600 is budgeted for direct labor, and \$2,089,080 is budgeted for factory overhead. After considering work in process inventories, the total budgeted cost of goods manufactured and transferred to finished goods during 2016 is \$9,517,180. Based on expected sales, the budgeted cost of goods sold is \$9,047,780.



## Example Exercise 21-5 Cost of Goods Sold Budget



Prepare a cost of goods sold budget for Landon Awards Co. using the information in Example Exercises 21-3 and 21-4. Assume the estimated inventories on January 1, 2016, for finished goods and work in process were \$54,000 and \$47,000, respectively. Also assume the desired inventories on December 31, 2016, for finished goods and work in process were \$50,000 and \$49,000, respectively. Factory overhead was budgeted for \$126,000.

(Continued)

Finished goods inventory, January 1, 2016			\$ 54,000
Work in process inventory, January 1, 2016		\$ 47,000	
Direct materials:			
Direct materials inventory, January 1, 2014			
(240,000 × \$0.12, from EE 21-3)	\$ 28,800		
Direct materials purchases (from EE 21-3)	536,640		
Cost of direct materials available for use	\$565,440		
Less direct materials inventory, December 31, 2016			
(200,000 × \$0.12, from EE 21-3)	24,000		
Cost of direct materials placed in production	\$541,440		
Direct labor (from EE 21-4)	103,400		
Factory overhead	126,000		
Total manufacturing costs		770,840	
Total work in process during period		\$817,840	
Less work in process inventory, December 31, 2016		49,000	
Cost of goods manufactured			768,840
Cost of finished goods available for sale			\$822,840
Less finished goods inventory, December 31, 2016			50,000
Cost of goods sold			\$772,840

## **Selling and Administrative Expenses Budget**

The sales budget is often used as the starting point for the selling and administrative expenses budget. For example, a budgeted increase in sales may require more advertising expenses.

Practice Exercises: PE 21-5A, PE 21-5B

Exhibit 15 illustrates the selling and administrative expenses budget for **Elite Accessories Inc.** 

## **EXHIBIT 15**

Selling and Administrative Expenses Budget

	А	В	С				
1	Elite Accessories Inc.						
2	Selling and Administrative Expens	es Budget					
3	For the Year Ending December 3	31, 2016					
4	Selling expenses:						
5	Sales salaries expense	\$715,000					
6	Advertising expense	360,000					
7	Travel expense	115,000					
8	Total selling expenses		\$1,190,000				
9	Administrative expenses:						
10	Officers' salaries expense	\$360,000					
11	Office salaries expense	258,000					
12	Office rent expense	34,500					
13	Office supplies expense	17,500					
14	Miscellaneous administrative expenses	25,000					
15	Total administrative expenses		695,000				
16	Total selling and administrative expenses		\$1,885,000				

The selling and administrative expenses budget shown in Exhibit 15 is normally supported by departmental schedules. For example, an advertising expense schedule for the Marketing Department could include the advertising media to be used (newspaper, direct mail, television), quantities (column inches, number of pieces, minutes), and related costs per unit.

## **Budgeted Income Statement**

The budgeted income statement for **Elite Accessories Inc.** in Exhibit 16 is prepared by integrating the following budgets:

- Sales budget (Exhibit 9)
- Cost of goods sold budget (Exhibit 14)
- Selling and administrative expenses budget (Exhibit 15)

In addition, estimates of other income, other expense, and income tax are also integrated into the budgeted income statement.

This budget summarizes the budgeted operating activities of the company. In doing so, the budgeted income statement allows management to assess the effects of estimated sales, costs, and expenses on profits for the year.

## EXHIBIT 16 But

#### **Budgeted Income Statement**

	A	В	;	С		
1	Elite Accessories Inc.					
2	Budgeted Income Stateme					
3	For the Year Ending December 3	31, 201	ô			
4	Revenue from sales (from Exhibit 9)			\$13,336,00	0	Sales budget
5	Cost of goods sold (from Exhibit 14)			9,047,78	0	Cost of goods sold
6						budget
7	Gross profit			\$ 4,288,22	0	
8	Selling and administrative expenses:					Selling and
9	Selling expenses (from Exhibit 15)	\$1,19	0,000		7	- administrative
10	Administrative expenses (from Exhibit 15)	69	5,000			expenses budget
11	Total selling and administrative expenses			1,885,00	0	expenses budget
12	Income from operations			\$ 2,403,22	0	
13	Other income:					
14	Interest revenue	\$ 9	8,000			
15	Other expenses:					
16	Interest expense	9	0,000	8,00	0	
17	Income before income tax			\$ 2,411,22	0	
18	Income tax			600,00	0	
19	Net income			\$ 1,811,22	0	

## **Financial Budgets**

While the operating budgets reflect the operating activities of the company, the financial budgets reflect the financing and investing activities. In this section, the following financial budgets are described and illustrated:



- Cash budget
- Capital expenditures budget

## **Cash Budget**

The **cash budget** estimates the expected receipts (inflows) and payments (outflows) of cash for a period of time. The cash budget is integrated with the various operating budgets. In addition, the capital expenditures budget, dividends, and equity or long-term debt financing plans of the company affect the cash budget.

#### Note:

The cash budget presents the expected receipts and payments of cash for a period of time. To illustrate, a monthly cash budget for January, February, and March 2016 for **Elite Accessories Inc.** is prepared. The preparation of the cash budget begins by estimating cash receipts.

**Estimated Cash Receipts** The primary source of estimated cash receipts is from cash sales and collections on account. In addition, cash receipts may be obtained from plans to issue equity or debt financing as well as other sources such as interest revenue.

To estimate cash receipts from cash sales and collections on account, a *schedule of collections from sales* is prepared. To illustrate, the following data for **Elite Accessories Inc.** are used:

	January	February	March
Sales:			
Budgeted sales	\$1,080,000	\$1,240,000	\$970,000
Accounts Receivable:			
Accounts receivable January 1, 2016	\$480,000		
Receipts from sales on account:			
From prior month's sales on account	40%		
From current month's sales on account	60		
	100%		

The budgeted cash collected for any month is the sum of the cash collected from previous month's sales and the cash collected from current month's sales. To illustrate, the cash collected in February is 40% of cash collected on sales in January ( $$1,080,000 \times 40\%$ ) added to 60% of cash collected on sales in February ( $$1,240,000 \times 60\%$ ), shown as follows:



Using the preceding data, Exhibit 17 shows the schedule of collections from sales for Elite Accessories for all three months. To simplify, it is assumed that all accounts receivable are collected and there are no cash sales.

## **EXHIBIT 17**

Schedule of Collections from Sales

	Α	В	С	D	Е	
1		Elite Accessories Inc.				
2		Schedule of Collections	s from Sales			
3		For the Three Months Endin	g March 31, 2	016		
4			January	February	March	
5	Cash collected from prior month's sales—Note A 480,000 432,000				496,000	
6	Cash collected from current month's sales—Note B 648,000 744,000				582,000	
7	Total receipts from sales on account \$1,128,000 \$1,176,		\$1,176,000	\$1,078,000		
8						
9	Note A:	\$480,000, given as January 1, 2016, Accou	nts Receivabl	e balance		
10		\$432,000 = \$1,080,000 × 40%				
11		$$496,000 = $1,240,000 \times 40\%$				
12						
13	Note B: \$648,000 = \$1,080,000 × 60%					
14	$$744,000 = $1,240,000 \times 60\%$					
15	$$582,000 = $970,000 \times 60\%$					

**Estimated Cash Payments** Estimated cash payments must be budgeted for operating costs and expenses such as manufacturing costs, selling expenses, and administrative expenses. In addition, estimated cash payments may be planned for capital expenditures, dividends, interest payments, or long-term debt payments.

To estimate cash payments for manufacturing costs, a *schedule of payments* for manufacturing costs is prepared. To illustrate, the following data for **Elite** Accessories Inc. are used:

	January	February	March
Manufacturing Costs:			
Budgeted manufacturing costs	\$840,000	\$780,000	\$812,000
Depreciation on machines included			
in manufacturing costs	24,000	24,000	24,000
Accounts Payable:			
Accounts payable, January 1, 2016	\$190,000		
Payments of manufacturing costs on account:			
From prior month's manufacturing costs	25%		
From current month's manufacturing costs	75		
-	100%		

The budgeted cash payments for any month are the sum of the cash paid from previous month's manufacturing costs (less depreciation) and the cash paid from current month's manufacturing costs (less depreciation). To illustrate, the cash paid in February is 25% of manufacturing costs (less depreciation) in January [(\$840,000 - \$24,000) × 25%] added to 75% of cash paid on manufacturing costs (less depreciation) in February [(\$780,000 - \$24,000) × 75%], computed as follows:



Using the preceding data, Exhibit 18 shows the schedule of payments for manufacturing costs for Elite Accessories for all three months.

	Α	В	С	D	Е
1	Elite Accessories Inc.				
2		Schedule of Payments for Ma			
3		For the Three Months Endin	g March 31, 2		
4			January	February	March
5	Paymer	nts of prior month's manufacturing costs			
6	{[25% >	<pre>&lt; previous month's manufacturing costs</pre>			
7		preciation)]—Note A}	\$190,000	\$204,000	\$189,000
8	Payments of current month's manufacturing costs				
9	9 {[75% × current month's manufacturing costs				
10	(less de	preciation)]—Note B}	612,000	567,000	591,000
11	Total pa	ayments	\$802,000	\$771,000	\$780,000
12					
13	Note A:	\$190,000, given as January 1, 2016, Accou	nts Payable b	alance	
14		$$204,000 = ($840,000 - $24,000) \times 25\%$			
15	$$189,000 = ($780,000 - $24,000) \times 25\%$				
16					
17	Note B: $\$612,000 = (\$840,000 - \$24,000) \times 75\%$				
18	$$567,000 = ($780,000 - $24,000) \times 75\%$				
19		$$591,000 = ($812,000 - $24,000) \times 75\%$	1		

# EXHIBIT 18 schedule of

Schedule of Payments for Manufacturing Costs **Completing the Cash Budget** The cash budget is structured for a budget period as follows:

#### **Budget Period:**

Estimated cash receipts	
<ul> <li>Estimated cash payments</li> </ul>	
Cash increase (decrease)	
+ Cash balance at the beginning of the month	
Cash balance at the end of the month	→ Becomes the beginning balance for the next period
– Minimum cash balance	
Excess (deficiency)	

The budgeted balance at the end of the period is determined by adding the net increase (decrease) for the period to the beginning cash balance. The ending balance is compared to a minimum cash balance to support operations as determined by management. Any difference between the ending balance and the minimum cash balance represents an excess or deficiency that may require management action.

To illustrate, assume the following additional data for Elite Accessories Inc.:

Cash balance on January 1, 2016	\$225,000
Quarterly taxes paid on March 31, 2016	150,000
Quarterly interest expense paid on January 10, 2016	22,500
Quarterly interest revenue received on March 21, 2016	24,500
Sewing equipment purchased in February 2016	274,000
Colling and administrative expenses (maid in month in surred).	

Selling and administrative expenses (paid in month incurred):

January	February	March	
\$160,000	\$165,000	\$145,000	

The cash budget for Elite Accessories is shown in Exhibit 19.

The estimated cash receipts include the total receipts from sales on account (Exhibit 17). The estimated cash payments include the cash payments from manufacturing costs (Exhibit 18). Other receipts and payments are provided by the additional information. Additionally, assume the minimum cash balance is \$340,000.

## **EXHIBIT 19**

#### **Cash Budget**

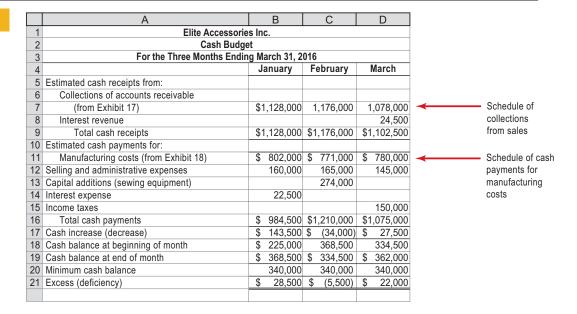


Exhibit 19 indicates that Elite Accessories expects a cash excess at the end of January of \$28,500. This excess could be invested in temporary income-producing securities such as U.S. Treasury bills or notes. In contrast, the estimated cash deficiency at the end of February of \$5,500 might require Elite Accessories to borrow cash from its bank.

## Example Exercise 21-6 Cash Budget



Landon Awards Co. collects 25% of its sales on account in the month of the sale and 75% in the month following the sale. If sales on account are budgeted to be \$100,000 for March and \$126,000 for April, what are the budgeted cash receipts from sales on account for April?

## Follow My Example 21-6

	April
Collections from March sales (75% × \$100,000)	\$ 75,000
Collections from April sales (25% × \$126,000)	31,500
Total receipts from sales on account	\$106,500

Practice Exercises: PE 21-6A, PE 21-6B

## **Capital Expenditures Budget**

The **capital expenditures budget** summarizes plans for acquiring fixed assets. Such expenditures are necessary as machinery and other fixed assets wear out or become obsolete. In addition, purchasing additional fixed assets may be necessary to meet increasing demand for the company's product.

To illustrate, a five-year capital expenditures budget for **Elite Accessories Inc.** is shown in Exhibit 20.

	A	В	С	D	Е	F
1	E	lite Access	ories Inc.			
2	Capit	al Expendi	tures Budg	get		
3	For the Five Years Ending December 31, 2020					
4	Item	2016	2017	2018	2019	2020
5	Machinery—Cutting Department	\$400,000			\$280,000	\$360,000
6	Machinery—Sewing Department	274,000	\$260,000	\$560,000	200,000	
7	Office equipment		90,000			60,000
8	Total	\$674,000	\$350,000	\$560,000	\$480,000	\$420,000

EXHIBIT 20

Capital Expenditures Budget

As shown in Exhibit 20, capital expenditures budgets are often prepared for five to ten years into the future. This is necessary because fixed assets often must be ordered years in advance. Likewise, it could take years to construct new buildings or other production facilities.

The capital expenditures budget should be integrated with the operating and financing budgets. For example, depreciation of new manufacturing equipment affects the factory overhead cost budget. The plans for financing the capital expenditures also affect the cash budget.

## **Budgeted Balance Sheet**

The budgeted balance sheet is prepared based on the operating and financial budgets of the master budget. The budgeted balance sheet is dated as of the end of the budget period and is similar to a normal balance sheet except that estimated amounts are used. For this reason, a budgeted balance sheet for Elite Accessories Inc. is not illustrated.

# At a Glance 21



## Describe budgeting, its objectives, and its impact on human behavior.

**Key Points** Budgeting involves (1) establishing plans (planning), (2) directing operations (directing), and (3) evaluating performance (controlling). In addition, budgets should be established to avoid human behavior problems.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the planning, directing, controlling, and feedback elements of the budget process.</li> </ul>		
• Describe the behavioral issues associated with tight goals, loose goals, and goal conflict.		



Describe the basic elements of the budget process, the two major types of budgeting, and the use of computers in budgeting.

**Key Points** The budget estimates received by the budget committee should be carefully studied, analyzed, revised, and integrated. The static and flexible budgets are two major budgeting approaches. Computers can be used to make the budget process more efficient and organizationally integrated.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe a static budget and explain when it might be used.		
<ul> <li>Describe and prepare a flexible budget and explain when it might be used.</li> </ul>	EE21-1	PE21-1A, 21-1B
• Describe the role of computers in the budget process.		



#### Describe the master budget for a manufacturing company.

**Key Points** The master budget consists of operating and financial budgets.

Learning Outcome	Example Exercises	Practice Exercises
• Illustrate the connection between the major operating and financial budgets.		



## Prepare the basic operating budgets for a manufacturing company.

**Key Points** The basic operating budgets are the sales budget, production budget, direct materials purchases budget, direct labor cost budget, factory overhead cost budget, cost of goods sold budget, and selling and administrative expenses budget. These can then be combined to prepare an income statement budget.

Learning Outcomes	Example Exercises	Practice Exercises
Prepare a sales budget.		
Prepare a production budget.	EE21-2	PE21-2A, 21-2B
• Prepare a direct materials purchases budget.	EE21-3	PE21-3A, 21-3B
• Prepare a direct labor cost budget.	EE21-4	PE21-4A, 21-4B
• Prepare a factory overhead cost budget.		
• Prepare a cost of goods sold budget.	EE21-5	PE21-5A, 21-5B
• Prepare a selling and administrative expenses budget.		
• Prepare an income statement budget.		



## Prepare financial budgets for a manufacturing company.

**Key Points** The cash budget and capital expenditures budget are financial budgets showing the investing and financing activities of the firm.

Learning Outcomes	Example Exercises	Practice Exercises
• Prepare cash receipts and cash payments schedules.	EE21-6	PE21-6A, 21-6B
• Prepare a cash budget.		
• Prepare a capital expenditures budget.		

## **Key Terms**

budgets (982) budgetary slack (983) capital expenditures budget (1001) cash budget (997) continuous budgeting (984) cost of goods sold budget (994) direct labor cost budget (992) direct materials purchases budget (991) factory overhead cost budget (994) flexible budgets (986) goal conflict (983) master budget (988) production budget (990) responsibility center (982) sales budget (989) static budget (985) zero-based budgeting (985)

# **Illustrative Problem**

Selected information concerning sales and production for Cabot Co. for July 2016 are summarized as follows:

a. Estimated sales:

Product K: 40,000 units at \$30 per unit Product L: 20,000 units at \$65 per unit

b. Estimated inventories, July 1, 2016:

Material A:	4,000 lbs.	Product K:	3,000 units at \$17 per unit	\$ 51,000
Material B:	3,500 lbs.	Product L:	2,700 units at \$35 per unit	94,500
		Total		\$145,500

There were no work in process inventories estimated for July 1, 2016.

c. Desired inventories at July 31, 2016:

Material A:	3,000 lbs.	Product K:	2,500 units at \$17 per unit	\$ 42,500
Material B:	2,500 lbs.	Product L:	2,000 units at \$35 per unit	70,000
		Total		\$112,500

There were no work in process inventories desired for July 31, 2016.

d. Direct materials used in production:

	Product K	Product L
Material A:	0.7 lb. per unit	3.5 lbs. per unit
Material B:	1.2 lbs. per unit	1.8 lbs. per unit

e. Unit costs for direct materials:

Material A: \$4.00 per lb.
Material B: \$2.00 per lb.

f. Direct labor requirements:

		Department 1	Department 2
	Product K Product L	0.4 hr. per unit 0.6 hr. per unit	0.15 hr. per unit 0.25 hr. per unit
g.	Ploduct L	Department 1	Department 2
	Direct labor rate	\$12.00 per hr.	\$16.00 per hr.

h. Estimated factory overhead costs for July:

Indirect factory wages	\$200,000
Depreciation of plant and equipment	40,000
Power and light	25,000
Indirect materials	34,000
Total	\$299,000

## **Instructions**

- 1. Prepare a sales budget for July.
- 2. Prepare a production budget for July.
- 3. Prepare a direct materials purchases budget for July.
- 4. Prepare a direct labor cost budget for July.
- 5. Prepare a cost of goods sold budget for July.

## Solution

1.		А	В	С	D		
	1		Cabot Co.				
	2		Sales Budget				
	3	For th	For the Month Ending July 31, 2016				
	4	Product	<b>Unit Sales Volume</b>	<b>Unit Selling Price</b>	Total Sales		
	5	Product K	40,000	\$30.00	\$1,200,000		
	6	Product L	20,000	65.00	1,300,000		
	7	Total revenue from sales			\$2,500,000		

	A	В	С
1	Cabot Co.		
2	Production Budget		
3	For the Month Ending July 31, 2	016	
4		Un	its
5		Product K	Product L
6	Sales	40,000	20,000
7	Plus desired inventories at July 31, 2016	2,500	2,000
8	Total	42,500	22,000
9	Less estimated inventories, July 1, 2016	3,000	2,700
10	Total production	39,500	19,300

	А	В	С	D	Е	F	G
1		Cabo	ot Co.				
2		Direct Materials Purchases Budget					
3		For the Month En	ding July	31, 2	016		
4			Dir	ect N	laterials		
5			Materia	ΙA	Materia	ΙB	Total
6	Units required for pr	oduction:					
7	Product K (39,50)	$0  imes  ext{lbs. per unit)}$	27,650	lbs.*	47,400	lbs.*	
8	Product L (19,300	X lbs. per unit)	67,550	**	34,740	**	
9	Plus desired units of	inventory,					
10	July 31, 2016		3,000		2,500		
11	Total		98,200	lbs.	84,640	lbs.	
12	Less estimated units	of inventory,					
13	July 1, 2016		4,000		3,500		
14	Total units to be pur	chased	94,200	lbs.	81,140	lbs.	
15	Unit price		× \$4.00		× \$2.00		
16	Total direct materials	s purchases	\$376,800		\$162,280		\$539,080
17							
18	$^*27,650 = 39,500 \times 0.7$	$47,400 = 39,500 \times 1.2$					
19	**67,550 = 19,300 × 3.5	$34,740 = 19,300 \times 1.8$					

í.		Α	В	С	D	Е	F	G
	1		Cabo	ot Co.				
	2		Direct Labor	Cost Budg	get			
	3		For the Month En	ding July 3	31, 2	016		
	4			Departme	nt 1	Departme	nt 2	Total
	5	Hours required for p	roduction:					
	6	Product K (39,50)	0  imes hrs. per unit)	15,800	*	5,925	*	
	7	Product L (19,300	0  imes hrs. per unit)	11,580	**	4,825	**	
	8	Total		27,380		10,750		
	9	Hourly rate		×\$12.00		×\$16.00		
	10	Total direct labor	cost	\$328,560		\$172,000		\$500,560
	11							
	12	*15,800 = 39,500 × 0.4	$5,925 = 39,500 \times 0.15$					
	13	**11,580 = 19,300 × 0.6	$4,825 = 19,300 \times 0.25$					

	A	В	С	D
1	Cabot Co.	•		
2	Cost of Goods Sold Bud	get		
3	For the Month Ending July 3	1, 2016		
4	Finished goods inventory, July 1, 2016			\$ 145,500
5	Direct materials:			
6	Direct materials inventory, July 1, 2016 (Note A)		\$ 23,000	
7	Direct materials purchases		539,080	
8	Cost of direct materials available for use		\$562,080	
9	Less direct materials inventory, July 31, 2016 (Note B)		17,000	
10	Cost of direct materials placed in production		\$545,080	
11	Direct labor		500,560	
12	Factory overhead		299,000	
13	Cost of goods manufactured			1,344,640
14	Cost of finished goods available for sale			\$1,490,140
15	Less finished goods inventory, July 31, 2016			112,500
16	Cost of goods sold			\$1,377,640
17				
18	Note A:			
19	Material A 4,000 lbs. at \$4.00 per lb.	\$16,000		
20	Material B 3,500 lbs. at \$2.00 per lb.	7,000		
21	Direct materials inventory, July 1, 2016	\$23,000		
22				
23	Note B:			
24	Material A 3,000 lbs. at \$4.00 per lb.	\$12,000		
25	Material B 2,500 lbs. at \$2.00 per lb.	5,000		
26	Direct materials inventory, July 31, 2016	\$17,000		

# **Discussion Questions**

- 1. What are the three major objectives of budgeting?
- 2. Briefly describe the type of human behavior problems that might arise if budget goals are set too tightly.
- 3. What behavioral problems are associated with setting a budget too loosely?
- 4. What behavioral problems are associated with establishing conflicting goals within the budget?
- 5. Under what circumstances would a static budget be appropriate?
- 6. How do computerized budgeting systems aid firms in the budgeting process?

- 7. Why should the production requirements set forth in the production budget be carefully coordinated with the sales budget?
- 8. Why should the timing of direct materials purchases be closely coordinated with the production budget?
- 9. a. Discuss the purpose of the cash budget.
- b. If the cash for the first quarter of the fiscal year indicates excess cash at the end of each of the first two months, how might the excess cash be used?
- 10. Give an example of how the capital expenditures budget affects other operating budgets.

## **Practice Exercises**

## **EE 21-1** *p. 987*

#### PE 21-1A Flexible budgeting

OBJ. 2



At the beginning of the period, the Assembly Department budgeted direct labor of \$112,000 and property tax of \$12,000 for 7,000 hours of production. The department actually completed 7,500 hours of production. Determine the budget for the department, assuming that it uses flexible budgeting.

#### **EE 21-1** p. 987

## PE 21-1B Flexible budgeting

OBJ. 2

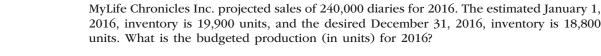


At the beginning of the period, the Fabricating Department budgeted direct labor of \$9,280 and equipment depreciation of \$2,300 for 640 hours of production. The department actually completed 600 hours of production. Determine the budget for the department, assuming that it uses flexible budgeting.

#### **EE 21-2** p. 990

#### PE 21-2A Production budget

**OBJ. 4** 





## EE 21-2 p. 990 PE 21-2B Production budget

OBJ. 4

Magnolia Candle Inc. projected sales of 75,000 candles for 2016. The estimated January 1, 2016, inventory is 3,500 units, and the desired December 31, 2016, inventory is 2,700 units. What is the budgeted production (in units) for 2016?



#### EE 21-3 p. 992 PE 21-

#### PE 21-3A Direct materials purchases budget

OBJ. 4

MyLife Chronicles Inc. budgeted production of 238,900 diaries in 2016. Paper is required to produce a diary. Assume five square yards of paper are required for each diary. The estimated January 1, 2016, paper inventory is 32,400 square yards. The desired December 31, 2016, paper inventory is 30,800 square yards. If paper costs \$0.30 per square yard, determine the direct materials purchases budget for 2016.



## EE 21-3 p. 992 PE 21-3B Direct materials purchases budget

OBJ. 4



Magnolia Candle Inc. budgeted production of 74,200 candles in 2016. Wax is required to produce a candle. Assume eight ounces (one-half of a pound) of wax is required for each candle. The estimated January 1, 2016, wax inventory is 2,500 pounds. The desired December 31, 2016, wax inventory is 2,100 pounds. If candle wax costs \$4.10 per pound, determine the direct materials purchases budget for 2016.

#### **EE 21-4** p. 994

#### PE 21-4A Direct labor cost budget

**OBJ. 4** 



MyLife Chronicles Inc. budgeted production of 238,900 diaries in 2016. Each diary requires assembly. Assume that six minutes are required to assemble each diary. If assembly labor costs \$12.00 per hour, determine the direct labor cost budget for 2016.

#### **EE 21-4** *p. 994*

## PE 21-4B Direct labor cost budget

OBJ. 4



Magnolia Candle Inc. budgeted production of 74,200 candles in 2016. Each candle requires molding. Assume that 12 minutes are required to mold each candle. If molding labor costs \$14.00 per hour, determine the direct labor cost budget for 2016.

#### **EE 21-5** *p. 995*

## PE 21-5A Cost of goods sold budget

OBJ. 4



Prepare a cost of goods sold budget for MyLife Chronicles Inc. using the information in Practice Exercises 21-3A and 21-4A. Assume the estimated inventories on January 1, 2016, for finished goods and work in process were \$25,000 and \$19,000, respectively. Also assume the desired inventories on December 31, 2016, for finished goods and work in process were \$31,500 and \$16,700, respectively. Factory overhead was budgeted at \$197,100.

## **EE 21-5** *p. 995*

#### PE 21-5B Cost of goods sold budget

**OBJ. 4** 



Prepare a cost of goods sold budget for Magnolia Candle Inc. using the information in Practice Exercises 21-3B and 21-4B. Assume the estimated inventories on January 1, 2016, for finished goods and work in process were \$9,800 and \$3,600, respectively. Also assume the desired inventories on December 31, 2016, for finished goods and work in process were \$12,900 and \$3,500, respectively. Factory overhead was budgeted at \$109,600.

#### **EE 21-6** p. 1001

## PE 21-6A Cash budget

OBJ. 5



MyLife Chronicles Inc. collects 30% of its sales on account in the month of the sale and 70% in the month following the sale. If sales on account are budgeted to be \$170,000 for June and \$200,000 for July, what are the budgeted cash receipts from sales on account for July?

## **EE 21-6** *p. 1001*

## PE 21-6B Cash budget

OBJ. 5



Magnolia Candle Inc. pays 10% of its purchases on account in the month of the purchase and 90% in the month following the purchase. If purchases are budgeted to be \$11,900 for March and \$12,700 for April, what are the budgeted cash payments for purchases on account for April?

## **Exercises**

#### EX 21-1 Personal budget

OBJ. 2, 5

✓ a. December 31 cash balance, \$3,000





At the beginning of the 2016 school year, Katherine Malloy decided to prepare a cash budget for the months of September, October, November, and December. The budget must plan for enough cash on December 31 to pay the spring semester tuition, which is the same as the fall tuition. The following information relates to the budget:

Cash balance, September 1 (from a summer job)	\$5,750
Purchase season football tickets in September	210
Additional entertainment for each month	275
Pay fall semester tuition in September	3,700
Pay rent at the beginning of each month	600
Pay for food each month	235
Pay apartment deposit on September 2 (to be returned December 15)	500
Part-time job earnings each month (net of taxes)	1,400

OBJ. 2, 4

- a. Prepare a cash budget for September, October, November, and December.
- b. Are the four monthly budgets that are presented prepared as static budgets or flexible budgets?
- c. What are the budget implications for Katherine Malloy?

# **EX 21-2** Flexible budget for selling and administrative expenses for a service company

Cloud Productivity Inc. uses flexible budgets that are based on the following data:

Sales commissions	14% of sales
Advertising expense	18% of sales
Miscellaneous administrative expense	\$6,500 per month plus 12% of sales
Office salaries expense	\$28,000 per month
Customer support expenses	\$12,000 per month plus 20% of sales
Research and development expense	\$30,000 per month

Prepare a flexible selling and administrative expenses budget for March 2016 for sales volumes of \$400,000, \$500,000, and \$600,000.

## **EX 21-3** Static budget versus flexible budget

OBJ, 2, 4

The production supervisor of the Machining Department for Rodriguez Company agreed to the following monthly static budget for the upcoming year:

#### Rodriguez Company Machining Department Monthly Production Budget

Wages	\$384,000
Utilities	36,000
Depreciation	60,000
Total	\$480,000

The actual amount spent and the actual units produced in the first three months of 2016 in the Machining Department were as follows:

	<b>Amount Spent</b>	<b>Units Produced</b>
January	\$400,000	90,000
February	440,000	100,000
March	470 000	110 000

The Machining Department supervisor has been very pleased with this performance because actual expenditures for January–March have been less than the monthly static budget of \$480,000. However, the plant manager believes that the budget should not remain fixed for every month but should "flex" or adjust to the volume of work that is produced in the Machining Department. Additional budget information for the Machining Department is as follows:

Wages per hour	\$16.00
Utility cost per direct labor hour	\$1.50
Direct labor hours per unit	0.20
Planned monthly unit production	120,000

- a. Prepare a flexible budget for the actual units produced for January, February, and March in the Machining Department. Assume depreciation is a fixed cost.
- b. Compare the flexible budget with the actual expenditures for the first three months. What does this comparison suggest?

✓ Total selling and administrative expenses at \$400,000 sales, \$332,500







✓ b. Excess of actual over budget for March, \$25,000





**EX 21-4** Flexible budget for Assembly Department

OBJ. 2

✓ Total department cost at 18,000 units, \$253,700







✓ Small scale budgeted production, 80,700 units



✓ b. Model DL total production, 4,830 units





✓ Total professional fees earned, \$10,270,000



**Steelcase Inc.** is one of the largest manufacturers of office furniture in the United States. In Grand Rapids, Michigan, it assembles filing cabinets in an Assembly Department. Assume the following information for the Assembly Department:

Direct labor per filing cabinet	12 minutes
Supervisor salaries	\$150,000 per month
Depreciation	\$24,500 per month
Direct labor rate	\$22 per hour

Prepare a flexible budget for 18,000, 20,000, and 22,000 filing cabinets for the month of August 2016 in the Assembly Department, similar to Exhibit 5.

## EX 21-5 Production budget

OBJ. 4

True Tab Inc. produces a small and large version of its popular electronic scale. The anticipated unit sales for the scales by sales region are as follows:

	Small Scale	Large Scale
North Region unit sales	38,000	67,000
South Region unit sales	43,000	79,000
Total	81,000	146,000

The finished goods inventory estimated for July 1, 2017, for the small and large scale models is 1,800 and 2,200 units, respectively. The desired finished goods inventory for July 31, 2017, for the small and large scale models is 1,500 and 2,500 units, respectively.

Prepare a production budget for the small and large scales for the month ended July 31, 2017.

## EX 21-6 Sales and production budgets

OBJ. 4

SoundLab Inc. manufactures two models of speakers, DL and XL. Based on the following production and sales data for September 2016, prepare (a) a sales budget and (b) a production budget:

	DL	XL
Estimated inventory (units), September 1	340	92
Desired inventory (units), September 30	300	101
Expected sales volume (units):		
East Region	2,560	1,080
West Region	2,310	930
Unit sales price	\$190	\$300

## EX 21-7 Professional fees earned budget for a service company

OBJ. 4

Rollins and Cohen, CPAs, offer three types of services to clients: auditing, tax, and small business accounting. Based on experience and projected growth, the following billable hours have been estimated for the year ending December 31, 2016:

	Billable Hours
Audit Department:	
Staff	22,400
Partners	7,900
Tax Department:	
Staff	13,200
Partners	5,500
Small Business Accounting Department:	
Staff	3,000
Partners	600

The average billing rate for staff is \$150 per hour, and the average billing rate for partners is \$320 per hour. Prepare a professional fees earned budget for Rollins and Cohen, CPAs, for the year ending December 31, 2016, using the following column headings and showing the estimated professional fees by type of service rendered:

Billable Hours	Hourly Rate	<b>Total Revenue</b>
----------------	-------------	----------------------

### EX 21-8 Professional labor cost budget for a service company

**OBJ.** 4

Based on the data in Exercise 21-7 and assuming that the average compensation per hour for staff is \$45 and for partners is \$140, prepare a professional labor cost budget for each department for Rollins and Cohen, CPAs, for the year ending December 31, 2016. Use the following column headings:

Staff Part	ners
------------	------

### EX 21-9 Direct materials purchases budget

OBJ. 4

Romano's Frozen Pizza Inc. has determined from its production budget the following estimated production volumes for 12" and 16" frozen pizzas for September 2016:

	Un	Units	
	12" Pizza	16" Pizza	
Budgeted production volume	5,300	8,900	

There are three direct materials used in producing the two types of pizza. The quantities of direct materials expected to be used for each pizza are as follows:

	12" Pizza	16" Pizza
Direct materials:		
Dough	0.70 lb. per unit	1.50 lbs. per unit
Tomato	0.40	0.70
Cheese	0.60	1.30

In addition, Romano's has determined the following information about each material:

	Dough	Tomato	Cheese
Estimated inventory, September 1, 2016	520 lbs.	200 lbs.	295 lbs.
Desired inventory, September 30, 2016	580 lbs.	185 lbs.	315 lbs.
Price per pound	\$0.80	\$1.60	\$2.40

Prepare September's direct materials purchases budget for Romano's Frozen Pizza Inc.

### **EX 21-10** Direct materials purchases budget

OBJ. 4

Coca-Cola Enterprises is the largest bottler of Coca-Cola® in Western Europe. The company purchases Coke® and Sprite® concentrate from The Coca-Cola Company, dilutes and mixes the concentrate with carbonated water, and then fills the blended beverage into cans or plastic two-liter bottles. Assume that the estimated production for Coke and Sprite two-liter bottles at the Wakefield, UK, bottling plant are as follows for the month of May:

Coke	153,000 two-liter bottles
Sprite	86,500 two-liter bottles

In addition, assume that the concentrate costs \$75 per pound for both Coke and Sprite and is used at a rate of 0.15 pound per 100 liters of carbonated water in blending Coke and 0.10 pound per 100 liters of carbonated water in blending Sprite. Assume that two liters of carbonated water are used for each two-liter bottle of finished product. Assume further that two-liter bottles cost \$0.08 per bottle and carbonated water costs \$0.06 per liter.

Prepare a direct materials purchases budget for May 2016, assuming inventories are ignored, because there are no changes between beginning and ending inventories for concentrate, bottles, and carbonated water.

✓ Staff total labor cost, \$1,737,000



✓ Total cheese purchases, \$35,448





✓ Concentrate budgeted purchases, \$47,400



### **EX 21-11** Direct materials purchases budget

**OBJ. 4** 

✓ Total steel belt purchases, \$291,200



truck tires. Rubber and steel belts are used in producing passenger car and truck tires as follows:

	Passenger Car	Truck
Rubber	35 lbs. per unit	78 lbs. per unit
Steel belts	5 lbs. per unit	8 lbs. per unit

Anticipated sales for Safety Grip Company were 42,000 passenger car tires and 19,000

The purchase prices of rubber and steel are \$1.20 and \$0.80 per pound, respectively. The desired ending inventories of rubber and steel belts are 40,000 and 10,000 pounds, respectively. The estimated beginning inventories for rubber and steel belts are 46,000 and 8,000 pounds, respectively.

Prepare a direct materials purchases budget for Safety Grip Company for the year ended December 31, 2016.

### EX 21-12 Direct labor cost budget

OBJ. 4

Ace Racket Company manufactures two types of tennis rackets, the Junior and Pro Striker models. The production budget for July for the two rackets is as follows:

	Junior	Pro Striker
Production budget	1,500 units	6,200 units

Both rackets are produced in two departments, Forming and Assembly. The direct labor hours required for each racket are estimated as follows:

	Forming Department	Assembly Department
Junior	0.16 hour per unit	0.24 hour per unit
Pro Striker	0.20 hour per unit	0.30 hour per unit

The direct labor rate for each department is as follows:

Forming Department	\$18.00 per hour
Assembly Department	\$14.00 per hour

Prepare the direct labor cost budget for July 2016.

### **EX 21-13** Direct labor budget for a service business

OBJ. 4

Ambassador Suites Inc. operates a downtown hotel property that has 300 rooms. On average, 80% of Ambassador Suites' rooms are occupied on weekdays, and 40% are occupied during the weekend. The manager has asked you to develop a direct labor budget for the housekeeping and restaurant staff for weekdays and weekends. You have determined that the housekeeping staff requires 30 minutes to clean each occupied room. The housekeeping staff is paid \$14 per hour. The housekeeping labor cost is fully variable to the number of occupied rooms. The restaurant has six full-time staff (eight-hour day) on duty, regardless of occupancy. However, for every 60 occupied rooms, an additional person is brought in to work in the restaurant for the eight-hour day. The restaurant staff is paid \$12 per hour.

Determine the estimated housekeeping, restaurant, and total direct labor cost for an average weekday and average weekend day. Format the budget in two columns, labeled as weekday and weekend day.

### EX 21-14 Production and direct labor cost budgets

OBJ. 4

Levi Strauss & Co. manufactures slacks and jeans under a variety of brand names, such as Dockers® and 501 Jeans®. Slacks and jeans are assembled by a variety of different sewing operations. Assume that the sales budget for Dockers and 501 Jeans shows estimated sales of 23,600 and 53,100 pairs, respectively, for May 2016. The finished goods inventory is assumed as follows:

	Dockers	501 Jeans
May 1 estimated inventory	670	1,660
May 31 desired inventory	420	1,860

✓ Total direct labor cost, Assembly, \$31,080

✓ Average weekday total, \$2,640



✓ a. Total production of 501 Jeans, 53,300





Assume the following direct labor data per 10 pairs of Dockers and 501 Jeans for four different sewing operations:

	Direct Labor per 10 Pairs	
	Dockers	501 Jeans
Inseam	18 minutes	9 minutes
Outerseam	20	14
Pockets	6	9
Zipper	12	_6
Total	56 minutes	38 minutes

- a. Prepare a production budget for May. Prepare the budget in two columns: Dockers® and 501 Jeans®.
- b. Prepare the May direct labor cost budget for the four sewing operations, assuming a \$13 wage per hour for the inseam and outerseam sewing operations and a \$15 wage per hour for the pocket and zipper sewing operations. Prepare the direct labor cost budget in four columns: inseam, outerseam, pockets, and zipper.

### EX 21-15 Factory overhead cost budget

OBJ. 4

Sweet Tooth Candy Company budgeted the following costs for anticipated production for August 2016:

Advertising expenses	\$232,000	Production supervisor wages	\$135,000
Manufacturing supplies	14,000	Production control wages	32,000
Power and light	48,000	Executive officer salaries	310,000
Sales commissions	298,000	Materials management wages	39,000
Factory insurance	30,000	Factory depreciation	22,000

Prepare a factory overhead cost budget, separating variable and fixed costs. Assume that factory insurance and depreciation are the only fixed factory costs.

### EX 21-16 Cost of goods sold budget

OBJ. 4

Delaware Chemical Company uses oil to produce two types of plastic products, P1 and P2. Delaware budgeted 35,000 barrels of oil for purchase in June for \$90 per barrel. Direct labor budgeted in the chemical process was \$240,000 for June. Factory overhead was budgeted \$400,000 during June. The inventories on June 1 were estimated to be:

Oil	\$15,200
P1	8,300
P2	8,600
Work in process	12 900

The desired inventories on June 30 were:

Oil	\$16,100
P1	9,400
P2	7,900
Work in process	13,500

Use the preceding information to prepare a cost of goods sold budget for June 2017.

### EX 21-17 Cost of goods sold budget

OBJ. 4

The controller of MingWare Ceramics Inc. wishes to prepare a cost of goods sold budget for September. The controller assembled the following information for constructing the cost of goods sold budget:

Direct materials:	Enamel	Paint	Porcelain	Total
Total direct materials purchases budgeted for September	\$36,780	\$6,130	\$145,500	\$188,410
Estimated inventory, September 1, 2016	1,240	950	4,250	6,440
Desired inventory, September 30, 2016	1,890	1,070	5,870	8,830

✓ Total variable factory overhead costs, \$268,000



✓ Cost of goods sold, \$3,788,100

✓ Cost of goods sold,

\$488,360



Desired inventory, September 30, 2016 1,890 1,070 5,870 8,830

Direct labor cost:	Kiln Department		De	corating Department	Total
Total direct labor cost budgeted for September	\$47,900			\$145,700	\$193,600
Finished goods inventories:	Dish	Bow	1	Figurine	Total
Estimated inventory, September 1, 2016	\$5,780	\$3,08	30	\$2,640	\$11,500
Desired inventory, September 30, 2016	3,710	2,67	70	3,290	9,670
Work in process inventories:					
Estimated inventory, September 1, 2016	\$3,400				
Desired inventory, September 30, 2016	1,990				
Budgeted factory overhead costs for September:					
Indirect factory wages	\$ 81,900				
Depreciation of plant and equipment	14,300				
Power and light	5,200				
Indirect materials	4,100				
Total	\$105,500				

Use the preceding information to prepare a cost of goods sold budget for September 2016.

### EX 21-18 Schedule of cash collections of accounts receivable

OBJ. 5

Pet Place Supplies Inc., a pet wholesale supplier, was organized on May 1, 2016. Projected sales for each of the first three months of operations are as follows:

May	\$134,000
June	155,000
July	169,000

All sales are on account. Sixty-five percent of sales are expected to be collected in the month of the sale, 30% in the month following the sale, and the remainder in the second month following the sale.

Prepare a schedule indicating cash collections from sales for May, June, and July.

### **EX 21-19** Schedule of cash collections of accounts receivable

OBJ. 5

OfficeMart Inc. has "cash and carry" customers and credit customers. OfficeMart estimates that 25% of monthly sales are to cash customers, while the remaining sales are to credit customers. Of the credit customers, 30% pay their accounts in the month of sale, while the remaining 70% pay their accounts in the month following the month of sale. Projected sales for the next three months of 2016 are as follows:

October	\$58,000
November	65,000
December	72,000

The Accounts Receivable balance on September 30, 2016, was \$35,000.

Prepare a schedule of cash collections from sales for October, November, and December.

### EX 21-20 Schedule of cash payments for a service company

OBJ. 5

Horizon Financial Inc. was organized on February 28, 2016. Projected selling and administrative expenses for each of the first three months of operations are as follows:

March	\$52,400
April	64,200
Mav	68,900

Depreciation, insurance, and property taxes represent \$9,000 of the estimated monthly expenses. The annual insurance premium was paid on February 28, and property taxes for the year will be paid in June. Seventy percent of the remainder of the expenses are expected to be paid in the month in which they are incurred, with the balance to be paid in the following month.

Prepare a schedule indicating cash payments for selling and administrative expenses for March, April, and May.

✓ Total cash collected in July, \$163,050





✓ Total cash collected in October, \$62,550

✓ Total cash payments in May, \$58,490



### EX 21-21 Schedule of cash payments for a service company

OBJ. 5

✓ Total cash payments in March, \$113,740



✓ Total capital expenditures in

2016, \$4,000,000



**January February** March Salaries \$56,900 \$ 68,100 \$ 72,200 Utilities 2,400 2,600 2,500 Other operating expenses 32,300 41,500 44,700 \$91,600 \$112,200 \$119,400 Total

EastGate Physical Therapy Inc. is planning its cash payments for operations for the first

quarter (January-March), 2017. The Accrued Expenses Payable balance on January 1 is

\$15,000. The budgeted expenses for the next three months are as follows:

Other operating expenses include \$3,000 of monthly depreciation expense and \$500 of monthly insurance expense that was prepaid for the year on May 1 of the previous year. Of the remaining expenses, 70% are paid in the month in which they are incurred, with the remainder paid in the following month. The Accrued Expenses Payable balance on January 1 relates to the expenses incurred in December.

Prepare a schedule of cash payments for operations for January, February, and March.

### EX 21-22 Capital expenditures budget

OBJ. 5

On January 1, 2016, the controller of Omicron Inc. is planning capital expenditures for the years 2016–2019. The following interviews helped the controller collect the necessary information for the capital expenditures budget:

*Director of Facilities*: A construction contract was signed in late 2015 for the construction of a new factory building at a contract cost of \$10,000,000. The construction is scheduled to begin in 2016 and be completed in 2017.

Vice President of Manufacturing: Once the new factory building is finished, we plan to purchase \$1.5 million in equipment in late 2017. I expect that an additional \$200,000 will be needed early in the following year (2018) to test and install the equipment before we can begin production. If sales continue to grow, I expect we'll need to invest another \$1,000,000 in equipment in 2019.

Chief Operating Officer: We have really been growing lately. I wouldn't be surprised if we need to expand the size of our new factory building in 2019 by at least 35%. Fortunately, we expect inflation to have minimal impact on construction costs over the next four years. Additionally, I would expect the cost of the expansion to be proportional to the size of the expansion.

Director of Information Systems: We need to upgrade our information systems to wireless network technology. It doesn't make sense to do this until after the new factory building is completed and producing product. During 2018, once the factory is up and running, we should equip the whole facility with wireless technology. I think it would cost us \$800,000 today to install the technology. However, prices have been dropping by 25% per year, so it should be less expensive at a later date.

Chief Financial Officer: I am excited about our long-term prospects. My only short-term concern is managing our cash flow while we expend the \$4,000,000 of construction costs on the portion of the new factory building scheduled to be completed in 2016.

Use this interview information to prepare a capital expenditures budget for Omicron Inc. for the years 2016–2019.

# **Problems: Series A**

### PR 21-1A Forecast sales volume and sales budget

OBJ. 4

For 2016, Raphael Frame Company prepared the sales budget that follows.

At the end of December 2016, the following unit sales data were reported for the year:

 Unit Sales

 8" × 10" Frame
 12" × 16" Frame

 East
 8,755
 3,686

 Central
 6,510
 3,090

 West
 12,348
 5,616

✓ 3. Total revenue from sales, \$878,403



### **Raphael Frame Company Sales Budget** For the Year Ending December 31, 2016

Product and Area	Unit Sales Volume	Unit Selling Price	Total Sales
8" × 10" Frame:			
East	8,500	\$16	\$136,000
Central	6,200	16	99,200
West	12,600	16	_201,600
Total	27,300		\$436,800
12" × 16" Frame:			
East	3,800	\$30	\$114,000
Central	3,000	30	90,000
West	5,400	30	162,000
Total	12,200		\$366,000
Total revenue from sales			\$802,800

For the year ending December 31, 2017, unit sales are expected to follow the patterns established during the year ending December 31, 2016. The unit selling price for the  $8" \times 10"$  frame is expected to increase to \$17 and the unit selling price for the  $12" \times 16"$ frame is expected to increase to \$32, effective January 1, 2017.

### **Instructions**

1. Compute the increase or decrease of actual unit sales for the year ended December 31, 2016, over budget. Place your answers in a columnar table with the following format:

	Unit Sales, Year Ended 2016		Increase (Decreas Actual Over Budg	
	Budget	<b>Actual Sales</b>	Amount	Percent
8" × 10" Frame:				
East				
Central				
West				
12" × 16" Frame:				
East				
Central				
West				

2. Assuming that the increase or decrease in actual sales to budget indicated in part (1) is to continue in 2017, compute the unit sales volume to be used for preparing the sales budget for the year ending December 31, 2017. Place your answers in a columnar table similar to that in part (1) but with the following column heads. Round budgeted units to the nearest unit.

2016	Percentage	2017
Actual	Increase	Budgeted
Units	(Decrease)	Units (rounded)

3. Prepare a sales budget for the year ending December 31, 2017.

### PR 21-2A Sales, production, direct materials purchases, and direct labor cost budgets OBJ. 4

The budget director of Gourmet Grill Company requests estimates of sales, production, and other operating data from the various administrative units every month. Selected information concerning sales and production for July 2016 is summarized as follows:

a. Estimated sales for July by sales territory:

# Maine: Vermont:

Backyard Chef ..... 310 units at \$700 per unit Master Chef..... 150 units at \$1,200 per unit Backyard Chef ..... 240 units at \$750 per unit Master Chef..... 110 units at \$1,300 per unit

✓ 3. Total direct materials purchases, \$771,490



New Hampshire: Backyard Chef ..... 360 units at \$750 per unit Master Chef..... 180 units at \$1,400 per unit b. Estimated inventories at July 1: Direct materials: Finished products: Backyard Chef ..... 290 units 30 units Stainless steel..... Master Chef..... 32 units 1.500 lbs. Burner subassemblies . . . . . . . . . 170 units Shelves..... 340 units c. Desired inventories at July 31: Direct materials: Finished products: Backyard Chef ..... 340 units 40 units Stainless steel..... 1,800 lbs. Master Chef..... 22 units Burner subassemblies ..... 155 units Shelves..... 315 units d. Direct materials used in production: In manufacture of Backyard Chef: 3 units per unit of product Stainless steel..... 24 lbs. per unit of product 2 units per unit of product Shelves..... 4 units per unit of product In manufacture of Master Chef: Grates..... 6 units per unit of product Stainless steel..... 42 lbs. per unit of product 4 units per unit of product Shelves..... 5 units per unit of product e. Anticipated purchase price for direct materials: \$15 per unit Burner subassemblies ..... 110 per unit Stainless steel..... \$6 per lb. \$10 per unit f. Direct labor requirements: **Backyard Chef:** 0.50 hr. at \$17 per hr. Stamping Department..... Forming Department..... 0.60 hr. at \$15 per hr. Assembly Department..... 1.0 hr. at \$14 per hr. Master Chef:

Stamping Department. 0.60 hr. at \$17 per hr.
Forming Department. 0.80 hr. at \$15 per hr.
Assembly Department. 1.50 hrs. at \$14 per hr.

### **Instructions**

- 1. Prepare a sales budget for July.
- 2. Prepare a production budget for July.
- 3. Prepare a direct materials purchases budget for July.
- 4. Prepare a direct labor cost budget for July.

### PR 21-3A Budgeted income statement and supporting budgets

**OBJ. 4** 

The budget director of Feathered Friends Inc., with the assistance of the controller, treasurer, production manager, and sales manager, has gathered the following data for use in developing the budgeted income statement for December 2016:

a. Estimated sales for December:

✓ 4. Total direct labor cost in Fabrication Dept., \$29,216



b. Estimated inventories at December 1:

Direct materials: Finished products:

Wood ......200 ft.Bird house ......320 units at \$27 per unitPlastic ......240 lbs.Bird feeder ......270 units at \$40 per unit

c. Desired inventories at December 31:

Direct materials: Finished products:

Wood ......220 ft.Bird house .....290 units at \$27 per unitPlastic ......200 lbs.Bird feeder .....250 units at \$41 per unit

d. Direct materials used in production:

In manufacture of Bird House: In manufacture of Bird Feeder:

Wood1.20 ft. per unit of productWood1.20 ft. per unit of productPlastic0.50 lb. per unit of productPlastic0.75 lb. per unit of product

e. Anticipated cost of purchases and beginning and ending inventory of direct materials:

f. Direct labor requirements:

Bird House:

Fabrication Department 0.20 hr. at \$16 per hr.
Assembly Department 0.30 hr. at \$12 per hr.

Bird Feeder:
Fabrication Department 0.40 hr. at \$16 per hr.
Assembly Department 0.35 hr. at \$12 per hr.

g. Estimated factory overhead costs for December:

Indirect factory wages\$75,000Power and light\$6,000Depreciation of plant and equipment23,000Insurance and property tax5,000

h. Estimated operating expenses for December:

Sales salaries expense \$70,000 Advertising expense 18,000 Office salaries expense 21,000 Depreciation expense—office equipment 600 Telephone expense—selling 550 Telephone expense—administrative 250 Travel expense—selling 4,000 Office supplies expense 200 Miscellaneous administrative expense 400

i. Estimated other income and expense for December:

Interest revenue \$200 Interest expense 122

j. Estimated tax rate: 30%

### Instructions

- 1. Prepare a sales budget for December.
- 2. Prepare a production budget for December.
- 3. Prepare a direct materials purchases budget for December.
- 4. Prepare a direct labor cost budget for December.
- 5. Prepare a factory overhead cost budget for December.
- 6. Prepare a cost of goods sold budget for December. Work in process at the beginning of December is estimated to be \$29,000, and work in process at the end of December is estimated to be \$35,400.
- 7. Prepare a selling and administrative expenses budget for December.
- 8. Prepare a budgeted income statement for December.

### PR 21-4A Cash budget

OBJ. 5

✓ 1. July deficiency, \$2,200





The controller of Sonoma Housewares Inc. instructs you to prepare a monthly cash budget for the next three months. You are presented with the following budget information:

	May	June	July
Sales	\$86,000	\$90,000	\$95,000
Manufacturing costs	34,000	39,000	44,000
Selling and administrative expenses	15,000	16,000	22,000
Capital expenditures			80,000

The company expects to sell about 10% of its merchandise for cash. Of sales on account, 70% are expected to be collected in the month following the sale and the remainder the following month (second month following sale). Depreciation, insurance, and property tax expense represent \$3,500 of the estimated monthly manufacturing costs. The annual insurance premium is paid in September, and the annual property taxes are paid in November. Of the remainder of the manufacturing costs, 80% are expected to be paid in the month in which they are incurred and the balance in the following month.

Current assets as of May 1 include cash of \$33,000, marketable securities of \$40,000, and accounts receivable of \$90,000 (\$72,000 from April sales and \$18,000 from March sales). Sales on account for March and April were \$60,000 and \$72,000, respectively. Current liabilities as of May 1 include \$6,000 of accounts payable incurred in April for manufacturing costs. All selling and administrative expenses are paid in cash in the period they are incurred. An estimated income tax payment of \$14,000 will be made in June. Sonoma's regular quarterly dividend of \$5,000 is expected to be declared in June and paid in July. Management desires to maintain a minimum cash balance of \$30,000.

### **Instructions**

- 1. Prepare a monthly cash budget and supporting schedules for May, June, and July 2016.
- 2. On the basis of the cash budget prepared in part (1), what recommendation should be made to the controller?

### PR 21-5A Budgeted income statement and balance sheet

OBJ. 4, 5

As a preliminary to requesting budget estimates of sales, costs, and expenses for the fiscal year beginning January 1, 2017, the following tentative trial balance as of December 31, 2016, is prepared by the Accounting Department of Regina Soap Co.:

Cash	\$ 85,000	
Accounts Receivable	125,600	
Finished Goods	69,300	
Work in Process	32,500	
Materials	48,900	
Prepaid Expenses	2,600	
Plant and Equipment	325,000	
Accumulated Depreciation—Plant and Equipment		\$156,200
Accounts Payable		62,000
Common Stock, \$10 par		180,000
Retained Earnings		290,700
	\$688,900	\$688,900

Factory output and sales for 2017 are expected to total 200,000 units of product, which are to be sold at \$5.00 per unit. The quantities and costs of the inventories at December 31, 2017, are expected to remain unchanged from the balances at the beginning of the year.

✓ 1. Budgeted net income, \$96,600



Budget estimates of manufacturing costs and operating expenses for the year are summarized as follows:

	Estimated Costs and Expenses	
	Fixed (Total for Year)	Variable (Per Unit Sold)
Cost of goods manufactured and sold:		
Direct materials	_	\$1.10
Direct labor	_	0.65
Factory overhead:		
Depreciation of plant and equipment	\$40,000	_
Other factory overhead	12,000	0.40
Selling expenses:		
Sales salaries and commissions	46,000	0.45
Advertising	64,000	_
Miscellaneous selling expense	6,000	0.25
Administrative expenses:		
Office and officers salaries	72,400	0.12
Supplies	5,000	0.10
Miscellaneous administrative expense	4,000	0.05

Balances of accounts receivable, prepaid expenses, and accounts payable at the end of the year are not expected to differ significantly from the beginning balances. Federal income tax of \$30,000 on 2017 taxable income will be paid during 2017. Regular quarterly cash dividends of \$0.15 per share are expected to be declared and paid in March, June, September, and December on 18,000 shares of common stock outstanding. It is anticipated that fixed assets will be purchased for \$75,000 cash in May.

### **Instructions**

- 1. Prepare a budgeted income statement for 2017.
- 2. Prepare a budgeted balance sheet as of December 31, 2017, with supporting calculations.

# **Problems: Series B**

### PR 21-1B Forecast sales volume and sales budget

OBJ. 4

Sentinel Systems Inc. prepared the following sales budget for 2016:

### Sentinel Systems Inc. Sales Budget For the Year Ending December 31, 2016

Product and Area	Unit Sales Volume	Unit Selling Price	Total Sales
Home Alert System:			
United States	1,700	\$200	\$ 340,000
Europe	580	200	116,000
Asia	450	200	90,000
Total	2,730		\$ 546,000
Business Alert System:			
United States	980	\$750	\$ 735,000
Europe	350	750	262,500
Asia	_240	750	180,000
Total	1,570		\$1,177,500
Total revenue from sales			\$1,723,500

At the end of December 2016, the following unit sales data were reported for the year:

# ✓ 3. Total revenue from sales, \$2,148,950



	Unit Sales		
	Home Alert System	Business Alert System	
United States	1,734	1,078	
Europe	609	329	
Asia	432	252	

For the year ending December 31, 2017, unit sales are expected to follow the patterns established during the year ending December 31, 2016. The unit selling price for the Home Alert System is expected to increase to \$250, and the unit selling price for the Business Alert System is expected to be decreased to \$820, effective January 1, 2017.

### Instructions

1. Compute the increase or decrease of actual unit sales for the year ended December 31, 2016, over budget. Place your answers in a columnar table with the following format:

	Unit Sales, Year Ended 2016		Increase (Decrease) Actual Over Budge	
	Budget	<b>Actual Sales</b>	Amount	Percent
Home Alert System:				
United States				
Europe				
Asia				
Business Alert System:				
United States				
Europe				
Asia				

2. Assuming that the increase or decrease in actual sales to budget indicated in part (1) is to continue in 2017, compute the unit sales volume to be used for preparing the sales budget for the year ending December 31, 2017. Place your answers in a columnar table similar to that in part (1) but with the following column heads. Round budgeted units to the nearest unit.

2016	Percentage	2017
Actual	Increase	Budgeted
Units	(Decrease)	Units (rounded)

3. Prepare a sales budget for the year ending December 31, 2017.

### PR 21-2B Sales, production, direct materials purchases, and direct labor cost budgets OBJ. 4

The budget director of Royal Furniture Company requests estimates of sales, production, and other operating data from the various administrative units every month. Selected information concerning sales and production for February 2016 is summarized as follows:

a. Estimated sales of King and Prince chairs for February by sales territory:



\$987,478

✓ 3. Total direct

materials purchases,

King	610 units at \$780 per unit
Prince	750 units at \$550 per unit
Southern Domestic:	
King	340 units at \$780 per unit
Prince	440 units at \$550 per unit
International	

b. Estimated inventories at February 1:

Northern Domestic:

Direct materials:		Finished products:	
Fabric	420 sq. yds.	King	90 units
Wood	580 linear ft.	Prince	25 units
Filler	250 cu. ft.		
Springs	660 units		

c. Desired inventories at February 28:

Direct materials:		Finished products:	
Fabric	390 sq. yds.	King	80 units
Wood	650 linear ft.	Prince	35 units
Filler	300 cu. ft.		
Springs	540 units		

d. Direct materials used in production:

In manufacture of King:	
Fabric	6.0 sq. yds. per unit of product
Wood	38 linear ft. per unit of product
Filler	4.2 cu. ft. per unit of product
Springs	16 units per unit of product
In manufacture of Prince:	
Fabric	4.0 sq. yds. per unit of product
Wood	26 linear ft. per unit of product
Filler	3.4 cu. ft. per unit of product
Springs	12 units per unit of product

e. Anticipated purchase price for direct materials:

Fabric	\$12.00 per sq. yd.	Filler	\$3.00 per cu. ft.
Wood	7.00 per linear ft.	Springs	4.50 per unit

f. Direct labor requirements:

King:

Framing Department	1.2 hrs. at \$12 per hr.
Cutting Department	0.5 hr. at \$14 per hr.
Upholstery Department	0.8 hr. at \$15 per hr.
Prince:	
Framing Department	1.0 hr. at \$12 per hr.
Cutting Department	0.4 hr. at \$14 per hr.
Upholstery Department	0.6 hr. at \$15 per hr.

### **Instructions**

- 1. Prepare a sales budget for February.
- 2. Prepare a production budget for February.
- 3. Prepare a direct materials purchases budget for February.
- 4. Prepare a direct labor cost budget for February.

### PR 21-3B Budgeted income statement and supporting budgets

OBJ. 4

The budget director of Gold Medal Athletic Co., with the assistance of the controller, treasurer, production manager, and sales manager, has gathered the following data for use in developing the budgeted income statement for March 2016:

a. Estimated sales for March:

Batting helmet	1,200 units at \$40 per unit
Football helmet	6.500 units at \$160 per unit

b. Estimated inventories at March 1:

Direct materials:		Finished products:	
Plastic	90 lbs.	Batting helmet	40 units at \$25 per unit
Foam lining	80 lbs.	Football helmet	240 units at \$77 per unit

✓ 4. Total direct labor cost in Assembly Dept., \$171,766



c. Desired inventories at March 31:

Direct materials: Finished products:

Plastic50 lbs.Batting helmet50 units at \$25 per unitFoam lining65 lbs.Football helmet220 units at \$78 per unit

d. Direct materials used in production:

In manufacture of batting helmet:

Plastic 3.50 lbs. per unit of product Foam lining 1.50 lbs. per unit of product

e. Anticipated cost of purchases and beginning and ending inventory of direct materials:

 Plastic
 \$6.00 per lb.

 Foam lining
 \$4.00 per lb.

f. Direct labor requirements:

Batting helmet:

 Molding Department
 0.50 hr. at \$20 per hr.

 Assembly Department
 1.80 hrs. at \$14 per hr.

g. Estimated factory overhead costs for March:

Indirect factory wages \$86,000 Power and light \$4,000 Depreciation of plant and equipment 12,000 Insurance and property tax 2,300

h. Estimated operating expenses for March:

Sales salaries expense	\$184,300
Advertising expense	87,200
Office salaries expense	32,400
Depreciation expense—office equipment	3,800
Telephone expense—selling	5,800
Telephone expense—administrative	1,200
Travel expense—selling	9,000
Office supplies expense	1,100
Miscellaneous administrative expense	1,000

i. Estimated other income and expense for March:

Interest revenue \$940 Interest expense 872

j. Estimated tax rate: 30%

### **Instructions**

- 1. Prepare a sales budget for March.
- 2. Prepare a production budget for March.
- 3. Prepare a direct materials purchases budget for March.
- 4. Prepare a direct labor cost budget for March.
- 5. Prepare a factory overhead cost budget for March.
- 6. Prepare a cost of goods sold budget for March. Work in process at the beginning of March is estimated to be \$15,300, and work in process at the end of March is desired to be \$14,800.
- 7. Prepare a selling and administrative expenses budget for March.
- 8. Prepare a budgeted income statement for March.

# ✓ 1. August deficiency, \$9,000





### PR 21-4B Cash budget

OBJ. 5

The controller of Mercury Shoes Inc. instructs you to prepare a monthly cash budget for the next three months. You are presented with the following budget information:

	June	July	August
Sales	\$160,000	\$185,000	\$200,000
Manufacturing costs	66,000	82,000	105,000
Selling and administrative expenses	40,000	46,000	51,000
Capital expenditures	_	_	120,000

The company expects to sell about 10% of its merchandise for cash. Of sales on account, 60% are expected to be collected in the month following the sale and the remainder the following month (second month after sale). Depreciation, insurance, and property tax expense represent \$12,000 of the estimated monthly manufacturing costs. The annual insurance premium is paid in February, and the annual property taxes are paid in November. Of the remainder of the manufacturing costs, 80% are expected to be paid in the month in which they are incurred and the balance in the following month.

Current assets as of June 1 include cash of \$42,000, marketable securities of \$25,000, and accounts receivable of \$198,000 (\$150,000 from May sales and \$48,000 from April sales). Sales on account in April and May were \$120,000 and \$150,000, respectively. Current liabilities as of June 1 include \$13,000 of accounts payable incurred in May for manufacturing costs. All selling and administrative expenses are paid in cash in the period they are incurred. An estimated income tax payment of \$24,000 will be made in July. Mercury Shoes' regular quarterly dividend of \$15,000 is expected to be declared in July and paid in August. Management desires to maintain a minimum cash balance of \$40,000.

### **Instructions**

- 1. Prepare a monthly cash budget and supporting schedules for June, July, and August 2016.
- 2. On the basis of the cash budget prepared in part (1), what recommendation should be made to the controller?

### PR 21-5B Budgeted income statement and balance sheet

**OBJ. 4, 5** 

As a preliminary to requesting budget estimates of sales, costs, and expenses for the fiscal year beginning January 1, 2017, the following tentative trial balance as of December 31, 2016, is prepared by the Accounting Department of Mesa Publishing Co.:

Cash	\$ 26,000	
Accounts Receivable	23,800	
Finished Goods	16,900	
Work in Process	4,200	
Materials	6,400	
Prepaid Expenses	600	
Plant and Equipment	82,000	
Accumulated Depreciation—Plant and Equipment		\$ 32,000
Accounts Payable		14,800
Common Stock, \$1.50 par		30,000
Retained Earnings		83,100
	\$159,900	\$159,900

Factory output and sales for 2017 are expected to total 3,800 units of product, which are to be sold at \$120 per unit. The quantities and costs of the inventories at December 31, 2017, are expected to remain unchanged from the balances at the beginning of the year.

# ✓ 1. Budgeted net income, \$114,660



Budget estimates of manufacturing costs and operating expenses for the year are summarized as follows:

	Estimated Costs and Expenses	
	Fixed (Total for Year)	Variable (Per Unit Sold)
Cost of goods manufactured and sold:		
Direct materials	_	\$30.00
Direct labor	_	8.40
Factory overhead:		
Depreciation of plant and equipment	\$ 4,000	_
Other factory overhead	1,400	4.80
Selling expenses:		
Sales salaries and commissions	12,800	13.50
Advertising	13,200	_
Miscellaneous selling expense	1,000	2.50
Administrative expenses:		
Office and officers salaries	7,800	7.00
Supplies	500	1.20
Miscellaneous administrative expense	400	2.40

Balances of accounts receivable, prepaid expenses, and accounts payable at the end of the year are not expected to differ significantly from the beginning balances. Federal income tax of \$35,000 on 2017 taxable income will be paid during 2017. Regular quarterly cash dividends of \$0.20 per share are expected to be declared and paid in March, June, September, and December on 20,000 shares of common stock outstanding. It is anticipated that fixed assets will be purchased for \$22,000 cash in May.

### **Instructions**

- 1. Prepare a budgeted income statement for 2017.
- 2. Prepare a budgeted balance sheet as of December 31, 2017, with supporting calculations.

# **Cases & Projects**





### CP 21-1 Ethics and professional conduct in business

The director of marketing for Starr Computer Co., Megan Hewitt, had the following discussion with the company controller, Cam Morley, on July 26 of the current year:

Megan: Cam, it looks like I'm going to spend much less than indicated on my July budget.

Cam: I'm glad to hear it.

Megan: Well, I'm not so sure it's good news. I'm concerned that the president will see that I'm under budget and reduce my budget in the future. The only reason that I look good is that we've delayed an advertising campaign. Once the campaign hits in September, I'm sure my actual expenditures will go up. You see, we are also having our sales convention in September. Having the advertising campaign and the convention at the same time is going to kill my September numbers.

Cam: I don't think that's anything to worry about. We all expect some variation in actual spending month to month. What's really important is staying within the budgeted targets for the year. Does that look as if it's going to be a problem?

Megan: I don't think so, but just the same, I'd like to be on the safe side.

Cam: What do you mean?

Megan: Well, this is what I'd like to do. I want to pay the convention-related costs in advance this month. I'll pay the hotel for room and convention space and purchase the airline tickets in advance. In this way, I can charge all these expenditures to July's budget. This would cause my actual expenses to come close to budget for July. Moreover, when the big advertising campaign hits in September, I won't have to worry about expenditures for the convention on my September budget as well. The convention costs will already be paid. Thus, my September expenses should be pretty close to budget.

Cam: I can't tell you when to make your convention purchases, but I'm not too sure that it should be expensed on July's budget.

Megan: What's the problem? It looks like "no harm, no foul" to me. I can't see that there's anything wrong with this—it's just smart management.

How should Cam Morley respond to Megan Hewitt's request to expense the advanced payments for convention-related costs against July's budget?



### CP 21-2 Evaluating budgeting systems in a service company

Children's Hospital of the King's Daughters Health System in Norfolk, Virginia, introduced a new budgeting method that allowed the hospital's annual plan to be updated for changes in operating plans. For example, if the budget was based on 400 patient-days (number of patients × number of days in the hospital) and the actual count rose to 450 patient-days, the variable costs of staffing, lab work, and medication costs could be adjusted to reflect this change. The budget manager stated, "I work with hospital directors to turn data into meaningful information and effect change before the month ends."

- a. What budgeting methods are being used under the new approach?
- b. Why are these methods superior to the former approaches?

### CP 21-3 Static budget for a service company

A bank manager of City Savings Bank Inc. uses the managerial accounting system to track the costs of operating the various departments within the bank. The departments include Cash Management, Trust, Commercial Loans, Mortgage Loans, Operations, Credit Card, and Branch Services. The static budget and actual results for the Operations Department are as follows:

Resources	Budget	Actual
Salaries	\$200,000	\$200,000
Benefits	30,000	30,000
Supplies	45,000	42,000
Travel	20,000	30,000
Training	25,000	35,000
Overtime	25,000	20,000
Total	\$345,000	\$357,000
Excess of actual over budget		\$ 12,000

- a. What information is provided by the budget? Specifically, what questions can the bank manager ask of the Operations Department manager?
- b. What information does the static budget fail to provide? Specifically, could the budget information be presented differently to provide even more insight for the bank manager?

### CP 21-4 Objectives of the master budget

**Domino's Pizza L.L.C.** operates pizza delivery and carry-out restaurants. The annual report describes its business as follows:

We offer a focused menu of high-quality, value-priced pizza with three types of crust (Hand-Tossed, Thin Crust, and Deep Dish), along with buffalo wings, bread sticks, cheesy bread, CinnaStix®, and Coca-Cola® products. Our hand-tossed pizza is made from fresh dough produced in our regional distribution centers. We prepare every pizza using real cheese, pizza sauce made from fresh tomatoes, and a choice of high-quality meat and vegetable toppings in generous portions. Our focused menu and use of premium ingredients enable us to consistently and efficiently produce the highest-quality pizza.

Over the 41 years since our founding, we have developed a simple, cost-efficient model. We offer a limited menu, our stores are designed for delivery and carry-out, and we do not generally offer dine-in service. As a result, our stores require relatively small, lower-rent locations and limited capital expenditures.

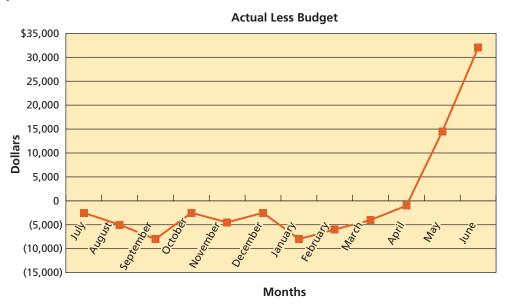
How would a master budget support planning, directing, and control for Domino's?





### CP 21-5 Integrity and evaluating budgeting systems

The city of Milton has an annual budget cycle that begins on July 1 and ends on June 30. At the beginning of each budget year, an annual budget is established for each department. The annual budget is divided by 12 months to provide a constant monthly static budget. On June 30, all unspent budgeted monies for the budget year from the various city departments must be "returned" to the General Fund. Thus, if department heads fail to use their budget by year-end, they will lose it. A budget analyst prepared a chart of the difference between the monthly actual and budgeted amounts for the recent fiscal year. The chart was as follows:



CP 21-6 Budget for a state government

Interpret the chart.

### **Group Project**

In a group, find the home page of the state in which you presently live. The home page will be of the form *www.statename.gov*. For example, the state of Tennessee would be found at www.tennessee.gov. At the home page site, search for annual budget information.

1. What are the budgeted sources of revenue and their percentage breakdown?

Suggest an improvement in the budget system.

- 2. What are the major categories of budgeted expenditures (or appropriations) and their percentage breakdown?
- 3. Is the projected budget in balance?

Internet Project



# Performance Evaluation Using Variances from Standard Costs

# BMW Group—Mini Cooper

hen you play a sport, you are evaluated with respect to how well you perform compared to a standard or to a competitor. In bowling, for example, your score is compared to a perfect score of 300 or to the scores of your competitors. In this class, you are compared to performance standards. These standards are often described in terms of letter grades, which provide a measure of how well you achieved the class objectives. In your job, you are also evaluated according to performance standards.

Just as your class performance is evaluated, managers are evaluated according to goals and plans. For example, **BMW Group** uses manufacturing standards at its automobile assembly plants to guide performance. The Mini Cooper, a BMW Group car, is manufactured in a modern facility in Oxford, England. There are

a number of performance targets used in this plant. For example, the bodyshell is welded by more than 250 robots so as to be two to three times stiffer than rival cars. In addition, the bodyshell dimensions are tested to the accuracy of the width of a human hair. Such performance standards are not surprising given the automotive racing background of John W. Cooper, the designer of the original Mini Cooper.

If you want to get a view of the BMW manufacturing process, go to the BMW Web site and search the phrase "How an automobile is born."

Performance is often measured as the difference between actual results and planned results. In this chapter, we will discuss and illustrate the ways in which business performance is evaluated.







Drivers for United Parcel Service (UPS) are expected to

drive a standard distance per day. Salespersons for **The Limited** are expected to meet sales standards.

# **Standards**

**Standards** are performance goals. Manufacturing companies normally use **standard cost** for each of the three following product costs:

- Direct materials
- Direct labor
- Factory overhead

Accounting systems that use standards for product costs are called **standard cost systems**. Standard cost systems enable management to determine the following:

- How much a product should cost (standard cost)
- How much it does cost (actual cost)

When actual costs are compared with standard costs, the exceptions or cost variances are reported. This reporting by the *principle of exceptions* allows management to focus on correcting the cost variances.

# **Setting Standards**

The standard-setting process normally requires the joint efforts of accountants, engineers, and other management personnel. The accountant converts the results of judgments and process studies into dollars and cents. Engineers with the aid of operation managers identify the materials, labor, and machine requirements needed to produce the product. For example, engineers estimate direct materials by studying the product specifications and estimating normal spoilage. Time and motion studies may be used to determine the direct labor required for each manufacturing operation. Engineering studies may also be used to determine standards for factory overhead, such as the amount of power needed to operate machinery.

# **Types of Standards**

Standards imply an acceptable level of production efficiency. One of the major objectives in setting standards is to motivate employees to achieve efficient operations.

**Ideal standards**, or *theoretical standards*, are standards that can be achieved only under perfect operating conditions, such as no idle time, no machine breakdowns, and no materials spoilage. Such standards may have a negative impact on performance because they may be viewed by employees as unrealistic.

**Currently attainable standards**, sometimes called *normal standards*, are standards that can be attained with reasonable effort. Such standards, which are used by most companies, allow for normal production difficulties and mistakes. When reasonable standards are used, employees focus more on cost and are more likely to put forth their best efforts.

An example from the game of golf illustrates the distinction between ideal and normal standards. In golf, *par* is an ideal standard for most players. Each player's USGA (United States Golf Association) handicap is the player's normal standard. The motivation of average players is to beat their handicaps because beating par is unrealistic for most players.

# **Reviewing and Revising Standards**

Standard costs should be periodically reviewed to ensure that they reflect current operating conditions. Standards should not be revised, however, just because they differ from actual costs. For example, the direct labor standard would not be revised just because employees are unable to meet properly set standards. On the other hand, standards should be revised when prices, product designs, labor rates, or manufacturing methods change.

# Integrity, Objectivity, and Ethics in Business



### **COMPANY REPUTATION: THE BEST OF THE BEST**

Harris Interactive annually ranks American corporations in terms of reputation. The ranking is based on how respondents rate corporations on 20 attributes in six major areas. The six areas are emotional appeal, products and services, financial performance, workplace environment,

social responsibility, and vision and leadership. What are the five highest ranked companies in its 2013 survey? The five highest (best) ranked companies were Amazon.com, Apple Inc., The Walt Disney Company, Google, and Johnson & Johnson.

Source: Harris Interactive, February 2012.

### **Criticisms of Standard Costs**

Some criticisms of using standard costs for performance evaluation include the following:

- Standards limit operating improvements by discouraging improvement beyond the standard.
- Standards are too difficult to maintain in a dynamic manufacturing environment, resulting in "stale standards."
- Standards can cause employees to lose sight of the larger objectives of the organization by focusing only on efficiency improvement.
- Standards can cause employees to unduly focus on their own operations to the possible harm of other operations that rely on them.

Regardless of these criticisms, standards are used widely. In addition, standard costs are only one part of the performance evaluation system used by most companies. As discussed in this chapter, other nonfinancial performance measures are often used to supplement standard costs, with the result that many of the preceding criticisms are overcome.



# Business Connection

### STANDARD COSTING IN ACTION: **EXPANDING BREWING OPERATIONS**

In 2011, U.S. west coast craft brewers Sierra Nevada (CA) and New Belgium (CO) announced plans to expand their brewing operations to the Asheville, North Carolina, area. Both companies considered the standard cost of their product when making the decision to expand, and in selecting Asheville as their east coast location. The standard price of direct materials includes the cost of shipping direct materials to the manufacturers' place

of business. The Asheville location was desirable when considering these costs.

In addition, New Belgium projected that their Fort Collins, Colorado, brewery would reach maximum capacity in three to five years. While operating at 100% capacity creates a favorable overhead volume variance, exceeding 100% of capacity makes it very difficult to meet customer demand. Thus, New Belgium felt adding a new brewery prior to reaching 100% capacity at Fort Collins was supported. In both cases, standard costing was used to support the expansion and location decisions.

Sources: H. Dornbusch, "The Case For Low Mileage Beer," Brewers Association.org; J. McCurry, "Hops City: Beer Culture Comes to a Head in the Asheville Region," Site Selection, July 2012; J. Shikes, "New Belgium, maker of Fat Tire, plans a second brewery on the East Coast," Denver Westward, May 19, 2011.



# **Budgetary Performance Evaluation**

As discussed in Chapter 21, the master budget assists a company in planning, directing, and controlling performance. The control function, or budgetary performance evaluation, compares the actual performance against the budget.

To illustrate, Western Rider Inc., a manufacturer of blue jeans, uses standard costs in its budgets. The standards for direct materials, direct labor, and factory overhead are separated into the following two components:

- Standard price
- Standard quantity

The standard cost per unit for direct materials, direct labor, and factory overhead is computed as follows:

Standard Cost per Unit = Standard Price × Standard Quantity

Western Rider's standard costs per unit for its XL jeans are shown in Exhibit 1.

Manufacturing Costs	Standard Price	×	Standard Quantity per Pair	=	Standard Cost per Pair of XL Jeans
Direct materials	\$5.00 per sq. yd.		1.5 sq. yds.		\$ 7.50
Direct labor	\$9.00 per hr.		0.80 hr. per pair		7.20
Factory overhead	\$6.00 per hr.		0.80 hr. per pair		4.80
Total standard cost per pair					\$19.50

**EXHIBIT 1** 

Standard Cost for XL Jeans

As shown in Exhibit 1, the standard cost per pair of XL jeans is \$19.50, which consists of \$7.50 for direct materials, \$7.20 for direct labor, and \$4.80 for factory overhead.

The standard price and standard quantity are separated for each product cost. For example, Exhibit 1 indicates that for each pair of XL jeans, the standard price for direct materials is \$5.00 per square yard and the standard quantity is 1.5 square yards. The standard price and quantity are separated because the department responsible for their control is normally different. For example, the direct materials price per square yard is controlled by the Purchasing Department, and the direct materials quantity per pair is controlled by the Production Department.

As illustrated in Chapter 21, the master budget is prepared based on planned sales and production. The budgeted costs for materials purchases, direct labor, and factory overhead are determined by multiplying their standard costs per unit by the planned level of production. Budgeted (standard) costs are then compared to actual costs during the year for control purposes.

## **Budget Performance Report**

The differences between actual and standard costs are called **cost variances**. A **favorable cost variance** occurs when the actual cost is less than the standard cost. An **unfavorable cost variance** occurs when the actual cost exceeds the standard cost. These cost variances are illustrated in Exhibit 2.

Favorable Cost Variance		Unfavorable Cost Variance
	Actual cost < Standard cost at actual volumes	Actual cost > Standard cost at actual volumes

EXHIBIT 2

**Cost Variances** 

The report that summarizes actual costs, standard costs, and the differences for the units produced is called a **budget performance report**. To illustrate, assume that **Western Rider Inc.** produced the following pairs of jeans during June:

XL jeans produced and sold	5,000 pairs
Actual costs incurred in the june:	
Direct materials	\$ 40,150
Direct labor	38,500
Factory overhead	22,400
Total costs incurred	\$101,050

Exhibit 3 illustrates the budget performance report for June for Western Rider.

The budget performance report shown in Exhibit 3 is based on the actual units produced in June of 5,000 XL jeans. Even though 6,000 XL jeans might have been *planned* for production, the budget performance report is based on *actual* production.

### EXHIBIT 3

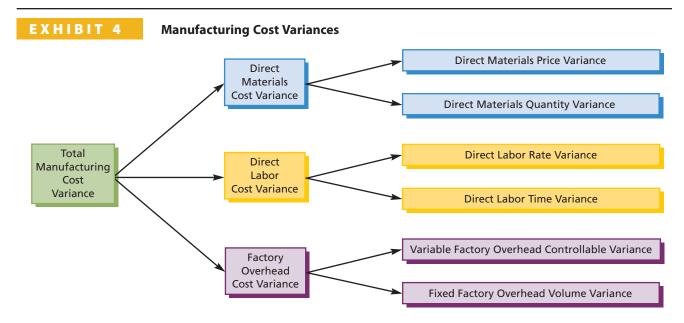
### **Budget Performance Report**

Western Rider Inc. Budget Performance Report For the Month Ended June 30, 2016				
Manufacturing Costs	Actual Costs	Standard Cost at Actual Volume (5,000 pairs of XL Jeans)*	Cost Variance— (Favorable) Unfavorable	
Direct materials.  Direct labor  Factory overhead  Total manufacturing costs  *5,000 pairs × \$7.50 per pair = \$37,500 5,000 pairs × \$7.20 per pair = \$36,000 5,000 pairs × \$4.80 per pair = \$24,000	\$ 40,150 38,500 22,400 \$101,050	\$37,500 36,000 _24,000 \$97,500	\$ 2,650 2,500 (1,600) \$ 3,550	

# **Manufacturing Cost Variances**

The **total manufacturing cost variance** is the difference between total standard costs and total actual cost for the units produced. As shown in Exhibit 3, the total manufacturing cost unfavorable variance is \$3,550, which consists of an unfavorable direct materials cost variance of \$2,650, and unfavorable direct labor cost variance of \$2,500, and a favorable factory overhead cost variance of \$1,600.

For control purposes, each product cost variance is separated into two additional variances as shown in Exhibit 4.



The total direct materials variance is separated into a *price* variance and a *quantity* variance. This is because standard and actual direct materials costs are computed as follows:

Actual Direct Materials Cost = Actual Price × Actual Quantity

Standard Direct Materials Cost = Standard Price × Standard Quantity

Direct Materials Cost Variance = Price Difference + Quantity Difference

Thus, the actual and standard direct materials costs may differ because of a price difference (variance), a quantity difference (variance), or both.

Likewise, the total direct labor variance is separated into a *rate* variance and a *time* variance. This is because standard and actual direct labor costs are computed as follows:

```
Actual Direct Labor Cost = Actual Rate × Actual Time

Standard Direct Labor Cost = Standard Rate × Standard Time

Direct Labor Cost Variance = Rate Difference + Time Difference
```

Therefore, the actual and standard direct labor costs may differ because of a rate difference (variance), a time difference (variance), or both.

The total factory overhead variance is separated into a *controllable* variance and a *volume* variance. Because factory overhead has fixed and variable cost elements, it uses different variances than direct materials and direct labor, which are variable costs.

In the next sections, the price and quantity variances for direct materials, the rate and time variances for direct labor, and the controllable and volume variances for factory overhead are further described and illustrated.

# **Direct Materials and Direct Labor Variances**



As indicated in the prior section, the total direct materials and direct labor variances are separated into the direct materials cost and direct labor cost variances for analysis and control purposes. These variances are illustrated in Exhibit 5.



### **EXHIBIT 5**

Direct Materials and Direct Labor Cost Variances

As a basis for illustration, the variances for Western Rider's June operations shown in Exhibit 3 are used.

### **Direct Materials Variances**

During June, **Western Rider Inc.** reported an unfavorable total direct materials cost variance of \$2,650 for the production of 5,000 XL style jeans, as shown in Exhibit 3. This variance was based on the following actual and standard costs:

Actual costs \$40,150
Standard costs 37,500
Total direct materials cost variance \$ 2,650

The actual costs incurred of \$40,150 consist of the following:

```
Actual Direct Materials Cost = Actual Price \times Actual Quantity
= ($5.50 per sq. yd.) \times (7,300 sq. yds.)
= $40,150
```

The standard costs of \$37,500 consist of the following:

```
Standard Direct Materials Cost = Standard Price \times Standard Quantity
= $5.00 per sq. yd. \times 7,500 sq. yds.
= $37,500
```

The standard price of \$5.00 per square yard is taken from Exhibit 1. In addition, Exhibit 1 indicates that 1.5 square yards is the standard quantity of materials for producing one pair of XL jeans. Thus, 7,500 ( $5,000 \times 1.5$ ) square yards is the standard quantity of materials for producing 5,000 pairs of XL jeans.

Comparing the actual and standard cost computations indicates that the total direct materials unfavorable cost variance of \$2,650 is caused by the following:

- A price per square yard of \$0.50 (\$5.50 \$5.00) more than standard
- A quantity usage of 200 square yards (7,300 sq. yds. 7,500 sq. yds.) less than standard

The impact of these differences from standard is reported and analyzed as a direct materials *price* variance and direct materials *quantity* variance.

**Direct Materials Price Variance** The **direct materials price variance** is computed as follows:

```
Direct Materials Price Variance = (Actual Price – Standard Price) × Actual Quantity
```

If the actual price per unit exceeds the standard price per unit, the variance is unfavorable. This positive amount (unfavorable variance) can be thought of as increasing costs (a debit). If the actual price per unit is less than the standard price per unit, the variance is favorable. This negative amount (favorable variance) can be thought of as decreasing costs (a credit).

To illustrate, the direct materials price variance for **Western Rider Inc.** for June is \$3,650 (unfavorable), computed as follows:¹

```
Direct Materials Price Variance = (Actual Price – Standard Price) \times Actual Quantity = (\$5.50 - \$5.00) \times 7,300 sq. yds. = \$3,650 Unfavorable Variance
```

# **Direct Materials Quantity Variance** The direct materials quantity variance is computed as follows:

```
Direct Materials Quantity Variance = (Actual Quantity – Standard Quantity) × Standard Price
```

If the actual quantity for the units produced exceeds the standard quantity, the variance is unfavorable. This positive amount (unfavorable variance) can be thought of as increasing costs (a debit). If the actual quantity for the units produced is less than the standard quantity, the variance is favorable. This negative amount (favorable variance) can be thought of as decreasing costs (a credit).

To illustrate, the direct materials quantity variance for **Western Rider Inc.** for June is \$1,000 (favorable), computed as follows:

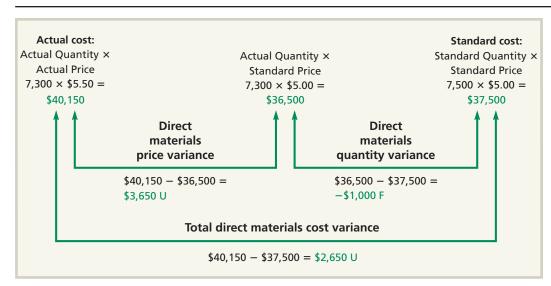
```
Direct Materials Quantity Variance = (Actual Quantity – Standard Quantity) \times Standard Price = (7,300 sq. yds. – 7,500 sq. yds.) \times $5.00 = -$1,000 Favorable Variance
```

**Direct Materials Variance Relationships** The relationship among the *total* direct materials cost variance, the direct materials *price* variance, and the direct materials *quantity* variance is shown in Exhibit 6.

**Reporting Direct Materials Variances** The direct materials quantity variances should be reported to the manager responsible for the variance. For example, an unfavorable quantity variance might be caused by either of the following:

- Equipment that has not been properly maintained
- Low-quality (inferior) direct materials

¹To simplify, it is assumed that there is no change in the beginning and ending materials inventories. Thus, the amount of materials budgeted for production equals the amount purchased.



**EXHIBIT 6** 

**Direct Materials** Variance Relationships



In the first case, the Operating Department responsible for maintaining the equipment should be held responsible for the variance. In the second case, the Purchasing Department should be held responsible.

Not all variances are controllable. For example, an unfavorable materials price variance might be due to market-wide price increases. In this case, there is nothing the Purchasing Department might have done to avoid the unfavorable variance. On the other hand, if materials of the same quality could have been purchased from another supplier at the standard price, the variance was controllable.

# Service Focus



## STANDARD COSTING IN THE **RESTAURANT INDUSTRY**

Many restaurants use standard costs to manage their business. Food costs are typically the largest expense for a restaurant. As a result, many restaurants use food quantity standards to control food costs by establishing the amount of food that is served to a customer. For example, Red Lobster restaurants, a division of Darden Restuarants, Inc., establishes food quantity standards for the number of shrimp, scallops, or clams on a seafood plate.

The second largest cost to most restaurants is labor cost. Many restaurants base their labor cost standards on the labor cost percentage, which is the ratio of total labor cost to total sales. This ratio helps the restaurants of Darden Restaurants, Inc., including the Olive Garden and Red Lobster, control and monitor labor costs. Focusing on this metric has paid off in recent years, as Darden's labor cost percentage dropped from 33.1% of sales in 2010, to 30.4% in the first quarter of 2013. This disciplined focus on food and labor cost standards has helped Darden increase earnings by 4% in the first quarter of 2013.

Source: N. Irwin, "What Olive Garden and Red Lobster tell us about the economy," The Washington Post, September 21, 2012.

# Example Exercise 22-1 Direct Materials Variances





Tip Top Corp. produces a product that requires six standard pounds per unit. The standard price is \$4.50 per pound. If 3,000 units required 18,500 pounds, which were purchased at \$4.35 per pound, what is the direct materials (a) price variance, (b) quantity variance, and (c) cost variance?

(Continued)

### Follow My Example 22-1

- a. Direct materials price variance:  $(\$4.35 \$4.50) \times 18,500 \text{ pounds} = -\$2,775 \text{ (favorable)}$
- b. Direct materials quantity variance:  $(18,500 \text{ pounds} 18,000 \text{ pounds}^*) \times $4.50 = $2,250 \text{ (unfavorable)}$
- c. Direct materials cost variance:** -\$2,775 + \$2,250 = -\$525 (favorable)
- * 3,000 units  $\times$  6 pounds
- ** Also computed as follows:

 $(\$4.35 \times 18,500 \text{ pounds}) - (\$4.50 \times 18,000 \text{ pounds})$ 

\$80,475 - \$81,000 = -\$525 (favorable)

Practice Exercises: PE 22-1A, PE 22-1B



The Internal Revenue Service publishes a time

standard for completing a tax return. The average 1040EZ return is expected to require eight hours to prepare.

### **Direct Labor Variances**

During June, **Western Rider Inc.** reported an unfavorable total direct labor cost variance of \$2,500 for the production of 5,000 XL style jeans, as shown in Exhibit 3. This variance was based on the following actual and standard costs:

Actual costs \$38,500
Standard costs 36,000
Total direct labor cost variance \$2,500

The actual costs incurred of \$38,500 consist of the following:

Actual Direct Labor Cost = Actual Rate per Hour  $\times$  Actual Time = \$10.00 per hr.  $\times$  3,850 hrs. = \$38,500

The standard costs of \$36,000 consist of the following:

Standard Direct Labor Cost = Standard Rate per Hour  $\times$  Standard Time = \$9.00 per hr.  $\times$  4,000 hrs. = \$36,000

The standard rate of \$9.00 per direct labor hour is taken from Exhibit 1. In addition, Exhibit 1 indicates that 0.80 hour is the standard time required for producing one pair of XL jeans. Thus, 4,000 (5,000 units  $\times$  0.80 hr.) direct labor hours is the standard for producing 5,000 pairs of XL jeans.

Comparing the actual and standard cost computations indicates that the total direct labor unfavorable cost variance of \$2,500 is caused by the following:

- A rate of \$1.00 per hour (\$10.00 \$9.00) more than standard
- A quantity of 150 hours (4,000 hrs. 3,850 hrs.) less than standard

The impact of these differences from standard is reported and analyzed as a direct labor *rate* variance and a direct labor *time* variance.

**Direct Labor Rate Variance** The direct labor rate variance is computed as follows:

Direct Labor Rate Variance = (Actual Rate per Hour – Standard Rate per Hour) × Actual Hours

If the actual rate per hour exceeds the standard rate per hour, the variance is unfavorable. This positive amount (unfavorable variance) can be thought of as increasing costs (a debit). If the actual rate per hour is less than the standard rate per hour, the variance is favorable. This negative amount (favorable variance) can be thought of as decreasing costs (a credit).

To illustrate, the direct labor rate variance for **Western Rider Inc.** in June is \$3,850 (unfavorable), computed as follows:

```
Direct Labor Rate Variance = (Actual Rate per Hour – Standard Rate per Hour) \times Actual Hours = (\$10.00 - \$9.00) \times 3,850 hours = \$3,850 Unfavorable Variance
```

# **Direct Labor Time Variance** The **direct labor time variance** is computed as follows:

```
Direct Labor Time Variance = (Actual Direct Labor Hours – Standard Direct Labor Hours)

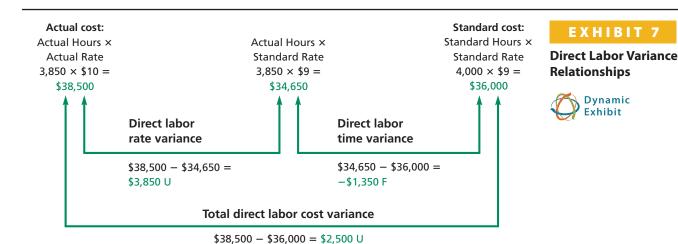
× Standard Rate per Hour
```

If the actual direct labor hours for the units produced exceeds the standard direct labor hours, the variance is unfavorable. This positive amount (unfavorable variance) can be thought of as increasing costs (a debit). If the actual direct labor hours for the units produced is less than the standard direct labor hours, the variance is favorable. This negative amount (favorable variance) can be thought of as decreasing costs (a credit).

To illustrate, the direct labor time variance for **Western Rider Inc.** for June is \$1,350 (favorable) computed as follows:

```
Direct Labor Time Variance = (Actual Direct Labor Hours – Standard Direct Labor Hours) \times Standard Rate per Hour = (3,850 hours – 4,000 direct labor hours) \times $9.00 = - $1,350 Favorable Variance
```

**Direct Labor Variance Relationships** The relationships among the *total* direct labor cost variance, the direct labor *rate* variance, and the direct labor *time* variance is shown in Exhibit 7.



**Reporting Direct Labor Variances** Production supervisors are normally responsible for controlling direct labor cost. For example, an investigation could reveal the following causes for unfavorable rate and time variances:

An unfavorable rate variance may be caused by the improper scheduling and use
of employees. In such cases, skilled, highly paid employees may be used in jobs
that are normally performed by unskilled, lower-paid employees. In this case, the
unfavorable rate variance should be reported to the managers who schedule work
assignments.

 An unfavorable time variance may be caused by a shortage of skilled employees. In such cases, there may be an abnormally high turnover rate among skilled employees.
 In this case, production supervisors with high turnover rates should be questioned as to why their employees are quitting.



**Direct Labor Standards for Nonmanufacturing Activities** Direct labor time standards can also be developed for use in administrative, selling, and service activities. This is most appropriate when the activity involves a repetitive task that produces a common output. In these cases, the use of standards is similar to that for a manufactured product.

To illustrate, standards could be developed for customer service personnel who process sales orders. A standard time for processing a sales order (the output) could be developed and used to control sales order processing costs. Similar standards could be developed for computer help desk operators, nurses, and insurance application processors.

When labor-related activities are not repetitive, direct labor time standards are less commonly used. For example, the time spent by a senior executive or the work of a research and development scientist would not normally be controlled using time standards.

## Example Exercise 22-2 Direct Labor Variances



Tip Top Corp. produces a product that requires 2.5 standard hours per unit at a standard hourly rate of \$12 per hour. If 3,000 units required 7,420 hours at an hourly rate of \$12.30 per hour, what is the (a) direct labor rate variance, (b) direct labor time variance, and (c) total direct labor cost variance?

### Follow My Example 22-2

- a. Direct labor rate variance:
  - $($12.30 $12.00) \times 7,420 \text{ hours} = $2,226 \text{ (unfavorable)}$
- b. Direct labor time variance:
  - $(7,420 \text{ hours} 7,500 \text{ hours}^*) \times $12.00 = -$960 \text{ (favorable)}$
- c. Total direct labor cost variance:** \$2,226 \$960 = \$1,266 (unfavorable)
- *3,000 units × 2.5 hours
- ** Also computed as follows:

 $(\$12.30 \times 7,420 \text{ hours}) - (\$12.00 \times 7,500 \text{ hours})$ 

\$91,266 - \$90,000 = \$1,266 (unfavorable)

Practice Exercises: PE 22-2A, PE 22-2B



# **Factory Overhead Variances**

Factory overhead costs are analyzed differently than direct labor and direct materials costs. This is because factory overhead costs have fixed and variable cost elements. For example, indirect materials and factory supplies normally behave as a variable cost as units produced changes. In contrast, straight-line plant depreciation on factory machinery is a fixed cost.

Factory overhead costs are budgeted and controlled by separating factory overhead into fixed and variable components. Doing so allows the preparation of flexible budgets and the analysis of factory overhead controllable and volume variances.

# The Factory Overhead Flexible Budget

The preparation of a flexible budget was described and illustrated in Chapter 21. Exhibit 8 illustrates a flexible factory overhead budget for **Western Rider Inc.** for June 2016.

	А	В	С	D	Е
1	Wes	tern Rider	nc.		
2	Factory Ov	erhead Co	st Budget		
3	For the Mont	h Ending Ju	ıne 30, 201	6	
4	Percent of normal capacity	80%	90%	100%	110%
5	Units produced	5,000	5,625	6,250	6,875
6	Direct labor hours (0.80 hr. per unit)	4,000	4,500	5,000	5,500
7	Budgeted factory overhead:				
8	Variable costs:				
9	Indirect factory wages	\$ 8,000	\$ 9,000	\$10,000	\$11,000
10	Power and light	4,000	4,500	5,000	5,500
11	Indirect materials	2,400	2,700	3,000	3,300
12	Total variable cost	\$14,400	\$16,200	\$18,000	\$19,800
13	Fixed costs:				
14	Supervisory salaries	\$ 5,500	\$ 5,500	\$ 5,500	\$ 5,500
15	Depreciation of plant				
16	and equipment	4,500	4,500	4,500	4,500
17	Insurance and property taxes	2,000	2,000	2,000	2,000
18	Total fixed cost	\$12,000	\$12,000	\$12,000	\$12,000
19	Total factory overhead cost	\$26,400	\$28,200	\$30,000	\$31,800
20					
21	Factory overhead rate per direct labor	r hour, \$30,0	$000 \div 5,000$	hours = \$6	.00

### **EXHIBIT 8**

Factory Overhead Cost Budget Indicating Standard Factory Overhead Rate

Exhibit 8 indicates that the budgeted factory overhead rate for Western Rider is \$6.00, computed as follows:

Factory Overhead Rate = 
$$\frac{\text{Budgeted Factory Overhead at Normal Capacity}}{\text{Normal Productive Capacity}}$$
$$= \frac{\$30,000}{5,000 \text{ direct labor hrs.}} = \$6.00 \text{ per direct labor hr.}$$

The normal productive capacity is expressed in terms of an activity base such as direct labor hours, direct labor cost, or machine hours. For Western Rider, 100% of normal capacity is 5,000 direct labor hours. The budgeted factory overhead cost at 100% of normal capacity is \$30,000, which consists of variable overhead of \$18,000 and fixed overhead of \$12,000.

For analysis purposes, the budgeted factory overhead rate is subdivided into a variable factory overhead rate and a fixed factory overhead rate. For Western Rider, the variable overhead rate is \$3.60 per direct labor hour, and the fixed overhead rate is \$2.40 per direct labor hour, computed as follows:

$$\label{eq:Variable Factory Overhead Rate} Variable Factory Overhead Rate = \frac{Budgeted Variable Overhead at Normal Capacity}{Normal Productive Capacity} \\ = \frac{\$18,000}{5,000 \text{ direct labor hrs.}} = \$3.60 \text{ per direct labor hr.} \\ Fixed Factory Overhead Rate = \frac{Budgeted Fixed Overhead at Normal Capacity}{Normal Productive Capacity} \\ = \frac{\$12,000}{5,000 \text{ direct labor hrs.}} = \$2.40 \text{ per direct labor hr.} \\ \\$$

To summarize, the budgeted factory overhead rates for Western Rider Inc. are as follows:

Variable factory overhead rate	\$3.60
Fixed factory overhead rate	2.40
Total factory overhead rate	\$6.00

As mentioned previously, factory overhead variances can be separated into a controllable variance and a volume variance as discussed in the next sections.

## **Variable Factory Overhead Controllable Variance**

The variable factory overhead **controllable variance** is the difference between the actual variable overhead costs and the budgeted variable overhead for actual production. It is computed as follows:

```
Variable Factory Overhead Controllable Variance = Actual Budgeted Variable Factory Overhead Variable Factory Overhead
```

If the actual variable overhead is less than the budgeted variable overhead, the variance is favorable. If the actual variable overhead exceeds the budgeted variable overhead, the variance is unfavorable.

The **budgeted variable factory overhead** is the standard variable overhead for the *actual* units produced. It is computed as follows:

```
Budgeted Variable Factory Overhead = Standard Hours for Actual Units Produced \times Variable Factory Overhead Rate
```

To illustrate, the budgeted variable overhead for **Western Rider Inc.** for June, when 5,000 units of XL jeans were produced, is \$14,400, computed as follows:

```
Budgeted Variable Factory Overhead = Standard Hours for Actual Units Produced
× Variable Factory Overhead Rate
= 4,000 direct labor hrs. × $3.60
= $14,400
```

The preceding computation is based on the fact that Western Rider produced 5,000 XL jeans, which requires a standard of 4,000 (5,000 units  $\times$  0.8 hr.) direct labor hours. The variable factory overhead rate of \$3.60 was computed earlier. Thus, the budgeted variable factory overhead is \$14,400 (4,000 direct labor hrs.  $\times$  \$3.60).

During June, assume that Western Rider incurred the following actual factory overhead costs:

	Actual Costs in June
Variable factory overhead	\$10,400
Fixed factory overhead	12,000
Total actual factory overhead	\$22,400

Based on the actual variable factory overhead incurred in June, the variable factory overhead controllable variance is a \$4,000 favorable variance, computed as follows:

```
Variable Factory Overhead Controllable Variance = Actual Variable Factory Overhead - Budgeted Variable Factory Overhead - Variable Factory Overhead - Variable Factory Overhead - - $4,000 Favorable Variance
```

The variable factory overhead controllable variance indicates the ability to keep the factory overhead costs within the budget limits. Because variable factory overhead costs are normally controllable at the department level, responsibility for controlling this variance usually rests with department supervisors.

# Example Exercise 22-3 Factory Overhead Controllable Variance



Tip Top Corp. produced 3,000 units of product that required 2.5 standard hours per unit. The standard variable overhead cost per unit is \$2.20 per hour. The actual variable factory overhead was \$16,850. Determine the variable factory overhead controllable variance.

### Follow My Example 22-3

Variable Factory Overhead Controllable Variance = Actual Variable Factory Overhead - Overhead =  $$16,850 - [(3,000 \text{ units} \times 2.5 \text{ hrs.}) \times $2.20]$  = \$16,850 - \$16,500 = \$350 (unfavorable)

Practice Exercises: PE 22-3A, PE 22-3B

# **Fixed Factory Overhead Volume Variance**

Western Rider's budgeted factory overhead is based on a 100% normal capacity of 5,000 direct labor hours, as shown in Exhibit 8. This is the expected capacity that management believes will be used under normal business conditions. Exhibit 8 indicates that the 5,000 direct labor hours is less than the total available capacity of 110%, which is 5,500 direct labor hours.

The fixed factory overhead **volume variance** is the difference between the budgeted fixed overhead at 100% of normal capacity and the standard fixed overhead for the actual units produced. It is computed as follows:

The volume variance measures the use of fixed overhead resources (plant and equipment). The interpretation of an unfavorable and a favorable fixed factory overhead volume variance is as follows:

- Unfavorable fixed factory overhead volume variance. The actual units produced is less than 100% of normal capacity; thus, the company used its fixed overhead resources (plant and equipment) less than would be expected under normal operating conditions.
- Favorable fixed factory overhead volume variance. The actual units produced is more than 100% of normal capacity; thus, the company used its fixed overhead resources (plant and equipment) more than would be expected under normal operating conditions.

To illustrate, the fixed factory overhead volume variance for **Western Rider Inc.** is a \$2,400 unfavorable variance, computed as follows:

Because Western Rider produced 5,000 XL jeans during June, the standard for the actual units produced is 4,000 (5,000 units  $\times$  0.80) direct labor hours. This is 1,000 hours less than the 5,000 standard hours of normal capacity. The fixed overhead rate of \$2.40 was computed earlier. Thus, the unfavorable fixed factory overhead volume variance is \$2,400 (1,000 direct labor hrs.  $\times$  \$2.40).

Exhibit 9 illustrates graphically the fixed factory overhead volume variance for **Western Rider Inc.** The budgeted fixed overhead does not change and is \$12,000 at all levels of production. At 100% of normal capacity (5,000 direct labor hours), the standard fixed overhead line intersects the budgeted fixed costs line. For production levels *more than* 100% of normal capacity (5,000 direct labor hours), the volume variance is *favorable*. For production levels *less than* 100% of normal capacity (5,000 direct labor hours), the volume variance is *unfavorable*.

### **EXHIBIT 9**

Graph of Fixed Overhead Volume Variance

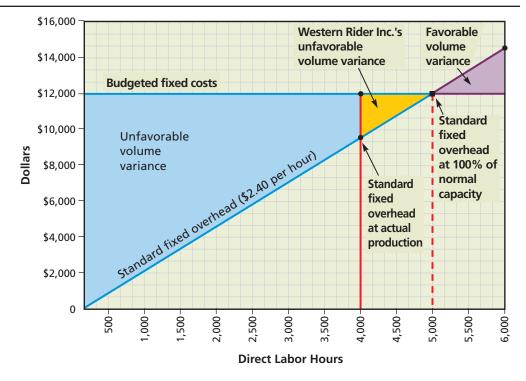


Exhibit 9 indicates that Western Rider's fixed factory overhead volume variance is unfavorable in June because the actual production is 4,000 direct labor hours, or 80% of normal volume. The unfavorable volume variance of \$2,400 can be viewed as the cost of the unused capacity (1,000 direct labor hours).

An unfavorable volume variance may be due to factors such as the following:

- Failure to maintain an even flow of work
- Machine breakdowns
- Work stoppages caused by lack of materials or skilled labor
- Lack of enough sales orders to keep the factory operating at normal capacity

Management should determine the causes of the unfavorable variance and consider taking corrective action. For example, a volume variance caused by an uneven flow of work could be remedied by changing operating procedures. Lack of sales orders may be corrected through increased advertising.

Favorable volume variances may not always be desirable. For example, in an attempt to create a favorable volume variance, manufacturing managers might run the factory above the normal capacity. However, if the additional production cannot be sold, it must be stored as inventory, which would incur storage costs.

## Example Exercise 22-4 Factory Overhead Volume Variance



Tip Top Corp. produced 3,000 units of product that required 2.5 standard hours per unit. The standard fixed overhead cost per unit is \$0.90 per hour at 8,000 hours, which is 100% of normal capacity. Determine the fixed factory overhead volume variance.

### Follow My Example 22-4

Fixed Factory Overhead Volume Variance = (Standard Hours for 100% of Normal Capacity – Standard Hours for Actual Units Produced) × Fixed Factory Overhead Rate

=  $[8,000 \text{ hrs.} - (3,000 \text{ units} \times 2.5 \text{ hrs.})] \times $0.90$ 

= (8,000 hrs. - 7,500 hrs.) × \$0.90

= \$450 (unfavorable)

Practice Exercises: PE 22-4A, PE 22-4B

# **Reporting Factory Overhead Variances**

The total factory overhead cost variance can also be determined as the sum of the variable factory overhead controllable and fixed factory overhead volume variances, computed as follows for **Western Rider Inc.**:

Variable factory overhead controllable variance Fixed factory overhead volume variance

Total factory overhead cost variance

-\$4,000 Favorable Variance2,400 Unfavorable Variance

-\$1,600 Favorable Variance

A factory overhead cost variance report is useful to management in controlling factory overhead costs. Budgeted and actual costs for variable and fixed factory overhead along with the related controllable and volume variances are reported by each cost element.

Exhibit 10 illustrates a factory overhead cost variance report for Western Rider Inc. for June.

	A	В	С	D	Е		
1	Western Rider Inc.						
2	Factory Overhead Cost Variance Report						
3	For the Month Ending June 30, 2016						
4	Productive capacity for the month (100	Productive capacity for the month (100% of normal) 5,000 hours					
5	Actual production for the month 4,000 hours						
6							
7		Budget					
8		(at Actual Varia					
9		Production)	Actual	Favorable	Unfavorabl		
10	Variable factory overhead costs:						
11	Indirect factory wages	\$ 8,000	\$ 5,100	\$2,900			
12	Power and light	4,000	4,200		\$ 200		
13	Indirect materials	2,400	1,100	1,300			
14	Total variable factory						
15	overhead cost	\$14,400	\$10,400				
16	Fixed factory overhead costs:						
17	Supervisory salaries	\$ 5,500	\$ 5,500				
18	Depreciation of plant and						
19	equipment	4,500	4,500				
20	Insurance and property taxes	2,000	2,000				
21	Total fixed factory						
22	overhead cost	\$12,000	\$12,000				
23	Total factory overhead cost	\$26,400	\$22,400				
24	Total controllable variances			\$4,200	\$ 200		
25							
26							
27	Net controllable variance—favorable						
28	Volume variance—unfavorable:						
29	Capacity not used at the standard rate for fixed						
30	factory overhead—1,000 $\times$ \$2.40 2,400						
31	Total factory overhead cost variance—favorable						

# EXHIBIT 10

Factory Overhead Cost Variance Report

# **Factory Overhead Account**

To illustrate, the applied factory overhead for **Western Rider Inc.** for the 5,000 XL jeans produced in June is \$24,000, computed as follows:

The total actual factory overhead for Western Rider, as shown in Exhibit 10, was \$22,400. Thus, the total factory overhead cost variance for Western Rider for June is a \$1,600 favorable variance, computed as follows:

```
Total Factory Overhead Cost Variance = Actual Factory Overhead – Applied Factory Overhead = $22,400 – $24,000 = -$1,600 Favorable Variance
```

At the end of the period, the factory overhead account normally has a balance. A debit balance in Factory Overhead represents underapplied overhead. Underapplied overhead occurs when actual factory overhead costs exceed the applied factory overhead. A credit balance in Factory Overhead represents overapplied overhead. Overapplied overhead occurs when actual factory overhead costs are less than the applied factory overhead.

The difference between the actual factory overhead and the applied factory overhead is the total factory overhead cost variance. Thus, underapplied and overapplied factory overhead account balances represent the following total factory overhead cost variances:

- Underapplied Factory Overhead = Unfavorable Total Factory Overhead Cost Variance
- Overapplied Factory Overhead = Favorable Total Factory Overhead Cost Variance

The factory overhead account for **Western Rider Inc.** for the month ending June 30, 2016, is as follows:

Factory Overhead						
Actual factory overhead	22,400	24,000 Applied factory overhead				
(\$10,400 + \$12,000)		(4,000 hrs. × \$6.00 per hr.)				
		Bal., June 30 1,600 Overapplied factory overhead				

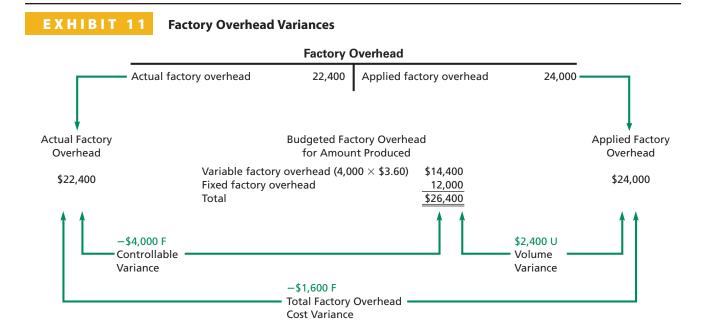
The \$1,600 overapplied factory overhead account balance and the favorable total factory overhead cost variance shown in Exhibit 10 are the same.

The variable factory overhead controllable variance and the volume variance can be computed by comparing the factory overhead account with the budgeted total overhead for the actual level produced, as shown in Exhibit 11.

The controllable and volume variances are determined as follows:

- The difference between the actual overhead incurred and the budgeted overhead is the controllable variance.
- The difference between the applied overhead and the budgeted overhead is the volume variance.

If the actual factory overhead exceeds (is less than) the budgeted factory overhead, the controllable variance is unfavorable (favorable). In contrast, if the applied factory overhead is less than (exceeds) the budgeted factory overhead, the volume variance is unfavorable (favorable).



# Recording and Reporting Variances from Standards

Journalize the entries for recording standards in the accounts and prepare an income statement that includes variances from standard.

Standard costs may be used as a management tool to control costs separately from the accounts in the general ledger. However, many companies include standard costs in their accounts. One method for doing so records standard costs and variances at the same time the actual product costs are recorded.

To illustrate, assume that **Western Rider Inc.** purchased, on account, the 7,300 square yards of blue denim used at \$5.50 per square yard. The standard price for direct materials is \$5.00 per square yard. The entry to record the purchase and the unfavorable direct materials price variance is as follows:

Materials (	7,300 sq. yds. × \$5.00)	36,500		
Direct Mat	erials Price Variance	3,650		
Accour	its Payable (7,300 sq. yds. $\times$ \$5.50)		40,150	

The materials account is debited for the *actual quantity* purchased at the *standard price*, \$36,500 (7,300 square yards  $\times$  \$5.00). Accounts Payable is credited for the \$40,150 actual cost and the amount due the supplier. The difference of \$3,650 is the unfavorable direct materials price variance [(\$5.50 - \$5.00)  $\times$  7,300 sq. yds.]. It is recorded by debiting Direct Materials Price Variance. If the variance had been favorable, Direct Materials Price Variance would have been credited for the variance.

A debit balance in the direct materials price variance account represents an unfavorable variance. Likewise, a credit balance in the direct materials price variance account represents a favorable variance.

The direct materials quantity variance is recorded in a similar manner. For example, **Western Rider Inc.** used 7,300 square yards of blue denim to produce 5,000 pairs of XL jeans. The standard quantity of denim for the 5,000 jeans produced is 7,500 square yards. The entry to record the materials used is as follows:

	Work in Process (7,500 sq. yds. × \$5.00)	37,500		
	Direct Materials Quantity Variance		1,000	
	Materials (7,300 sq. yds. × \$5.00)		36,500	

Work in Process is debited for \$37,500, which is the standard cost of the direct materials required to produce 5,000 XL jeans (7,500 sq. yds.  $\times$  \$5.00). Materials is credited for \$36,500, which is the actual quantity of materials used at the standard price (7,300 sq. yds.  $\times$  \$5.00). The difference of \$1,000 is the favorable direct materials quantity variance [(7,300 sq. yds. - 7,500 sq. yds.)  $\times$  \$5.00]. It is recorded by crediting Direct Materials Quantity Variance. If the variance had been unfavorable, Direct Materials Quantity Variance would have been debited for the variance.

A debit balance in the direct materials quantity variance account represents an unfavorable variance. Likewise, a credit balance in the direct materials quantity variance account represents a favorable variance.

### Example Exercise 22-5 Standard Cost Journal Entries



Tip Top Corp. produced 3,000 units that require six standard pounds per unit at the \$4.50 standard price per pound. The company actually used 18,500 pounds in production. Journalize the entry to record the standard direct materials used in production.

#### Follow My Example 22-5

 Work in Process (18,000* pounds × \$4.50)
 81,000

 Direct Materials Quantity Variance [(18,500 pounds – 18,000 pounds) × \$4.50]
 2,250

 Materials (18,500 pounds × \$4.50)
 83,250

*3,000 units  $\times$  6 pounds per unit = 18,000 standard pounds for units produced

Practice Exercises: PE 22-5A, PE 22-5B

The journal entries to record the standard costs and variances for *direct labor* are similar to those for direct materials. These entries are summarized as follows:

- Work in Process is debited for the standard cost of direct labor.
- Wages Payable is credited for the actual direct labor cost incurred.
- Direct Labor Rate Variance is debited for an unfavorable variance and credited for a favorable variance.
- Direct Labor Time Variance is debited for an unfavorable variance and credited for a favorable variance.

As illustrated in the prior section, the factory overhead account already incorporates standard costs and variances into its journal entries. That is, Factory Overhead is debited for actual factory overhead and credited for applied (standard) factory overhead. The ending balance of factory overhead (overapplied or underapplied) is

the total factory overhead cost variance. By comparing the actual factory overhead with the budgeted factory overhead, the controllable variance can be determined. By comparing the budgeted factory overhead with the applied factory overhead, the volume variance can be determined.

When goods are completed, Finished Goods is debited and Work in Process is credited for the standard cost of the product transferred.

At the end of the period, the balances of each of the variance accounts indicate the net favorable or unfavorable variance for the period. These variances may be reported in an income statement prepared for management's use.

Exhibit 12 is an example of an income statement for **Western Rider Inc.** that includes variances. In Exhibit 12, a sales price of \$28 per pair of jeans, selling expenses of \$14,500, and administrative expenses of \$11,225 are assumed.

#### Western Rider Inc. Income Statement For the Month Ended June 30, 2016 \$140,0001 Cost of goods sold—at standard..... 97,500² \$ 42,500 **Favorable** Unfavorable Less variances from standard cost: Direct materials price..... \$ 3,650 Direct materials quantity ..... \$1,000 Direct labor rate..... 3,850 1,350 4,000 Factory overhead controllable..... Factory overhead volume..... 2,400 3,550 \$ 38,950 Gross profit ..... Operating expenses: Selling expenses ...... \$14,500 11,225 25,725 Income before income tax ..... \$ 13,225 15.000 × \$28 ²\$37,500 + \$36,000 + \$24,000 (from Exhibit 3), or 5,000 × \$19.50 (from Exhibit 1)

#### **EXHIBIT 12**

Variance from Standards in Income Statement

The income statement shown in Exhibit 12 is for internal use by management. That is, variances are not reported to external users. Thus, the variances shown in Exhibit 12 must be transferred to other accounts in preparing an income statement for external users.

In preparing an income statement for external users, the balances of the variance accounts are normally transferred to Cost of Goods Sold. However, if the variances are significant or if many of the products manufactured are still in inventory, the variances should be allocated to Work in Process, Finished Goods, and Cost of Goods Sold. Such an allocation, in effect, converts these account balances from standard cost to actual cost.

### **Example Exercise 22-6** Income Statement with Variances



Prepare an income statement for the year ended December 31, 2016, through gross profit for Tip Top Corp. using the variance data in Example Exercises 22-1 through 22-4. Assume Tip Top sold 3,000 units at \$100 per unit.

(Continued)

<b>Tip Top</b> Income Statement ti	•	Fi+	
For the Year Ended			
Sales (3,000 units × \$100)			\$300,000
Cost of goods sold—at standard			194,250*
Gross profit—at standard			\$105,750
	Favorable	Unfavorable	
Less variances from standard cost:			
Direct materials price (EE22-1)	\$2,775		
Direct materials quantity (EE22-1)		\$2,250	
Direct labor rate (EE22-2)		2,226	
Direct labor time (EE22-2)	960		
Factory overhead controllable (EE22-3)		350	
Factory overhead volume (EE22-4)		450	1,541
Gross profit—actual			\$104,209
*Direct materials (3,000 units $\times$ 6 lbs. $\times$ \$4.50)	\$ 81,000		
Direct labor (3,000 units $\times$ 2.5 hrs. $\times$ \$12.00)	90,000		
Factory overhead [3,000 units $\times$ 2.5 hrs. $\times$ (\$2.20 + \$0.90)] Cost of goods sold at standard	23,250 \$194,250		



## **Nonfinancial Performance Measures**

Many companies supplement standard costs and variances from standards with non-financial performance measures. A **nonfinancial performance measure** expresses performance in a measure other than dollars. For example, airlines use on-time performance, percent of bags lost, and number of customer complaints as nonfinancial performance measures. Such measures are often used to evaluate the time, quality, or quantity of a business activity.

Using financial and nonfinancial performance measures aids managers and employees in considering multiple performance objectives. Such measures often bring additional perspectives, such as quality of work, to evaluating performance. Some examples of nonfinancial performance measures are shown in Exhibit 13.

#### **EXHIBIT 13**

Nonfinancial Performance Measures

- Inventory turnover
- Percent on-time delivery
- Elapsed time between a customer order and product delivery
- Customer preference rankings compared to competitors
- Response time to a service call
- Time to develop new products
- Employee satisfaction
- Number of customer complaints

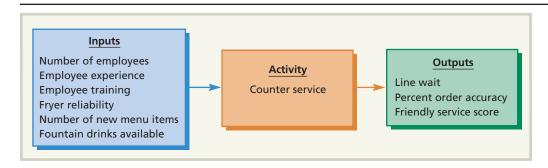
Nonfinancial measures are often linked to either the inputs or outputs of an activity or process. A **process** is a sequence of activities for performing a task. The relationship between an activity or a process and its inputs and outputs is shown in Exhibit 14.



#### **EXHIBIT 14**

Relationship Between a Process and Its Inputs and Outputs

To illustrate, the counter service activity of a fast-food restaurant is used. The inputs/outputs for providing counter service at a fast-food restaurant are shown in Exhibit 15.



#### **EXHIBIT 15**

Inputs / Outputs for a Fast-Food Restaurant

The customer service outputs of the counter service activity include the following:

- Line wait for the customer
- Percent order accuracy in serving the customer
- Friendly service experience for the customer

Some of the inputs that impact the customer service outputs include the following:

- Number of employees
- Employee experience
- Employee training
- Fryer (and other cooking equipment) reliability
- Number of new menu items
- Fountain drink availability

A fast-food restaurant can develop a set of linked nonfinancial performance measures across inputs and outputs. The output measures tell management how the activity is performing, such as keeping the line wait to a minimum. The input measures are used to improve the output measures. For example, if the customer line wait is too long, then improving employee training or hiring more employees could improve the output (decrease customer line wait).

## Example Exercise 22-7 Activity Inputs and Outputs



The following are inputs and outputs to the baggage claim process of an airline:

Baggage handler training

Time customers wait for returned baggage

Maintenance of baggage handling equipment

Number of baggage handlers

Number of damaged bags

On-time flight performance

Identify whether each is an input or output to the baggage claim process.

(Continued)

## Follow My Example 22-7

Baggage handler training Input
Time customers wait for returned baggage Output
Maintenance of baggage handling equipment Input
Number of baggage handlers Input
Number of damaged bags Output
On-time flight performance Input

Practice Exercises: PE 22-7A, PE 22-7B

# At a Glance 22



1052

#### Describe the types of standards and how they are established.

**Key Points** Standards represent performance goals that can be compared to actual results in evaluating performance. Standards are established so that they are neither too high nor too low, but are attainable.

Learning Outcomes	Example Exercises	Practice Exercises	
<ul> <li>Define ideal and currently attainable standards and explain how they are used in setting standards.</li> </ul>			
<ul> <li>Describe some of the criticisms of the use of standards.</li> </ul>			



#### Describe and illustrate how standards are used in budgeting.

**Key Points** Budgets are prepared by multiplying the standard cost per unit by the planned production. To measure performance, the standard cost per unit is multiplied by the actual number of units produced, and the actual results are compared with the standard cost at actual volumes (cost variance).

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Compute the standard cost per unit of production for materials, labor, and factory overhead.</li> </ul>	Excitacy	Excluses
<ul> <li>Compute the direct materials, direct labor, and factory overhead cost variances.</li> </ul>		
Prepare a budget performance report.		



#### Compute and interpret direct materials and direct labor variances.

**Key Points** The direct materials cost variance can be separated into direct materials price and quantity variances. The direct labor cost variance can be separated into direct labor rate and time variances.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Compute and interpret direct materials price and quantity variances.</li> </ul>	EE22-1	PE22-1A, 22-1B
<ul> <li>Compute and interpret direct labor rate and time variances.</li> </ul>	EE22-2	PE22-2A, 22-2B
<ul> <li>Describe and illustrate how time standards are used in nonmanufacturing settings.</li> </ul>		



#### Compute and interpret factory overhead controllable and volume variances.

**Key Points** The factory overhead cost variance can be separated into a variable factory overhead controllable variance and a fixed factory overhead volume variance.

Learning Outcomes	Example Exercises	Practice Exercises
• Prepare a factory overhead flexible budget.		
<ul> <li>Compute and interpret the variable factory overhead controllable variance.</li> </ul>	EE22-3	PE22-3A, 22-3B
<ul> <li>Compute and interpret the fixed factory overhead volume variance.</li> </ul>	EE22-4	PE22-4A, 22-4B
• Prepare a factory overhead cost variance report.		
• Evaluate factory overhead variances, using a T account.		



## Journalize the entries for recording standards in the accounts and prepare an income statement that includes variances from standard.

**Key Points** Standard costs and variances can be recorded in the accounts at the same time the manufacturing costs are recorded in the accounts. Work in Process is debited at standard. Under a standard cost system, the cost of goods sold will be reported at standard cost. Manufacturing variances can be disclosed on the income statement to adjust the gross profit at standard to the actual gross profit.

Journalize the entries to record the purchase and use of direct materials at standard, recording favorable or unfavorable variances.	Example Exercises EE22-5	Practice Exercises PE22-5A, 22-5B
<ul> <li>Prepare an income statement, disclosing favorable and unfavorable direct materials, direct labor, and factory overhead variances.</li> </ul>	EE22-6	PE22-6A, 22-6B



#### Describe and provide examples of nonfinancial performance measures.

**Key Points** Many companies use a combination of financial and nonfinancial measures in order for multiple perspectives to be incorporated in evaluating performance. Nonfinancial measures are often used in conjunction with the inputs or outputs of a process or an activity.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Define, provide the rationale for, and provide examples of nonfinancial performance measures.</li> </ul>		
• Identify nonfinancial inputs and outputs of an activity.	EE22-7	PE22-7A, 22-7B

## **Key Terms**

budget performance report (1033) budgeted variable factory overhead (1042) controllable variance (1042) cost variances (1033) currently attainable standards (1031) direct labor rate variance (1038) direct labor time variance (1039) direct materials price variance (1036) direct materials quantity variance (1036) factory overhead cost variance report (1045) favorable cost variance (1033) ideal standards (1031) nonfinancial performance measure (1050) process (1050) standard cost (1030) standard cost systems (1030) standards (1030) total manufacturing cost variance (1034) unfavorable cost variance (1033) volume variance (1043)

## Illustrative Problem

Hawley Inc. manufactures designer iPod cases for national distribution. The standard costs for the manufacture of Folk Art style baskets were as follows:

	Standard Costs	Actual Costs
Direct materials	1,500 lbs. at \$35	1,600 lbs. at \$32
Direct labor	4,800 hrs. at \$11	4,500 hrs. at \$11.80
Factory overhead	Rates per labor hour, based on 100% of normal capacity of 5,500 labor hrs.:	
	Variable cost, \$2.40	\$12,300 variable cost
	Fixed cost, \$3.50	\$19,250 fixed cost

#### **Instructions**

- 1. Determine the direct materials price variance, direct materials quantity variance, and total direct materials cost variance for the designer iPod cases.
- 2. Determine the direct labor rate variance, direct labor time variance, and total direct labor cost variance for the designer iPod cases.
- 3. Determine the variable factory overhead controllable variance, fixed factory overhead volume variance, and total factory overhead cost variance for the designer iPod cases.

#### Solution

1.

#### **Direct Materials Cost Variance**

#### **Price variance:**

Direct Materials Price Variance = (Actual Price – Standard Price)  $\times$  Actual Quantity = (\$32 per lb. – \$35 per lb.)  $\times$  1,600 lbs. = -\$4,800 Favorable Variance

#### **Quantity variance:**

Direct Materials Quantity Variance = (Actual Quantity – Standard Quantity)  $\times$  Standard Price = (1,600 lbs. – 1,500 lbs.)  $\times$  \$35 per lb. = \$3,500 Unfavorable Variance

#### **Total direct materials cost variance:**

Direct Materials Cost Variance = Direct Materials Quantity Variance + Direct Materials Price Variance = \$3,500 + (\$4,800) = -\$1,300 Favorable Variance

#### 2.

#### **Direct Labor Cost Variance**

#### **Rate variance:**

Direct Labor Rate Variance = (Actual Rate per Hour – Standard Rate per Hour)  $\times$  Actual Hours =  $(\$11.80 - \$11.00) \times 4,500$  hrs. = \$3,600 Unfavorable Variance

#### Time variance:

Direct Labor Time Variance = (Actual Direct Labor Hours – Standard Direct Labor Hours) ×
Standard Rate per Hour
= (4,500 hrs. – 4,800 hrs.) × \$11.00 per hour
= -\$3,300 Favorable Variance

#### **Total direct labor cost variance:**

Direct Labor Cost Variance = Direct Labor Time Variance + Direct Labor Rate Variance = (\$3,300) + \$3,600 = \$300 Unfavorable Variance

#### 3.

#### **Factory Overhead Cost Variance**

#### Variable factory overhead controllable variance:

Variable Factory Overhead = Actual Variable Factory Overhead – Budgeted Variable

Controllable Variance Factory Overhead – Budgeted Variable

Factory Overhead = \$12,300 - \$11,520*

= \$780 Unfavorable Variance

*4,800 hrs. × \$2.40 per hour

#### Fixed factory overhead volume variance:

Fixed Factory
Overhead Volume
Variance

Standard Hours for 100% - Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

Standard Hours for Actual Units Produced

#### **Total factory overhead cost variance:**

Factory Overhead
Cost Variance = Variable Factory Overhead + Fixed Factory Overhead
Controllable Variance + Volume Variance
= \$780 + \$2,450
= \$3,230 Unfavorable Variance

## **Discussion Questions**

- What are the basic objectives in the use of standard costs?
- What is meant by reporting by the "principle of exceptions," as the term is used in reference to cost control?
- 3. What are the two variances between the actual cost and the standard cost for direct materials?
- 4. The materials cost variance report for Nickols Inc. indicates a large favorable materials price variance and a significant unfavorable materials quantity variance. What might have caused these offsetting variances?
- 5. a. What are the two variances between the actual cost and the standard cost for direct labor?
  - b. Who generally has control over the direct labor cost variances?
- 6. A new assistant controller recently was heard to remark: "All the assembly workers in this plant are

- covered by union contracts, so there should be no labor variances." Was the controller's remark correct? Discuss.
- 7. Would the use of standards be appropriate in a nonmanufacturing setting, such as a fast-food restaurant?
- a. Describe the two variances between the actual costs and the standard costs for factory overhead.
  - b. What is a factory overhead cost variance report?
- 9. If variances are recorded in the accounts at the time the manufacturing costs are incurred, what does a debit balance in Direct Materials Price Variance represent?
- Briefly explain why firms might use nonfinancial performance measures.

## **Practice Exercises**

**EE 22-1** p.1037

#### PE 22-1A Direct materials variances

OBJ. 3



Lo-bed Company produces a product that requires two standard gallons per unit. The standard price is \$20.00 per gallon. If 4,000 units required 8,200 gallons, which were purchased at \$19.75 per gallon, what is the direct materials (a) price variance, (b) quantity variance, and (c) cost variance?

**EE 22-1** *p.1037* 

#### PE 22-1B Direct materials variances

OBJ. 3



Dvorak Company produces a product that requires five standard pounds per unit. The standard price is \$2.50 per pound. If 1,000 units required 4,500 pounds, which were purchased at \$3.00 per pound, what is the direct materials (a) price variance, (b) quantity variance, and (c) cost variance?

**EE 22-2** *p.1040* 

#### PE 22-2A Direct labor variances

OBJ. 3



Lo-bed Company produces a product that requires four standard hours per unit at a standard hourly rate of \$28.00 per hour. If 4,000 units required 16,750 hours at an hourly rate of \$28.40 per hour, what is the direct labor (a) rate variance, (b) time variance, and (c) cost variance?

#### **EE 22-2** p.1040

#### PE 22-2B Direct labor variances

OBJ. 3



Dvorak Company produces a product that requires three standard hours per unit at a standard hourly rate of \$17 per hour. If 1,000 units required 2,800 hours at an hourly rate of \$16.50 per hour, what is the direct labor (a) rate variance, (b) time variance, and (c) cost variance?

#### **EE 22-3** *p.1043*

#### PE 22-3A Factory overhead controllable variance

**OBJ. 4** 



Lo-bed Company produced 4,000 units of product that required four standard hours per unit. The standard variable overhead cost per unit is \$3.00 per hour. The actual variable factory overhead was \$51,240. Determine the variable factory overhead controllable variance.

#### **EE 22-3** p.1043

#### **PE 22-3B** Factory overhead controllable variance

OBJ. 4



Dvorak Company produced 1,000 units of product that required three standard hours per unit. The standard variable overhead cost per unit is \$1.40 per hour. The actual variable factory overhead was \$4,000. Determine the variable factory overhead controllable variance.

#### **EE 22-4** p.1044

#### PE 22-4A Factory overhead volume variance

OBJ. 4



Lo-bed Company produced 4,000 units of product that required four standard hours per unit. The standard fixed overhead cost per unit is \$1.20 per hour at 16,400 hours, which is 100% of normal capacity. Determine the fixed factory overhead volume variance.

#### **EE 22-4** p.1044

#### PE 22-4B Factory overhead volume variance

**OBJ. 4** 



Dvorak Company produced 1,000 units of product that required three standard hours per unit. The standard fixed overhead cost per unit is \$0.60 per hour at 3,500 hours, which is 100% of normal capacity. Determine the fixed factory overhead volume variance.

#### **EE 22-5** *p. 1048*

#### PE 22-5A Standard cost journal entries

OBJ. 5



Lo-bed Company produced 4,000 units that require two standard gallons per unit at \$20.00 standard price per gallon. The company actually used 8,200 gallons in production. Journalize the entry to record the standard direct materials used in production.

#### **EE 22-5** *p. 1048*

#### PE 22-5B Standard cost journal entries

OBJ. 5



Dvorak Company produced 1,000 units that require five standard pounds per unit at \$2.50 standard price per pound. The company actually used 4,500 pounds in production. Journalize the entry to record the standard direct materials used in production.

#### **EE 22-6** p. 1049

#### PE 22-6A Income statement with variances

OBJ. 5



Prepare a 2016 income statement through gross profit for Lo-bed Company, using the variance data in Practice Exercises 22-1A, 22-2A, 22-3A, and 22-4A. Assume Lo-bed sold 4,000 units at \$250 per unit.

#### **EE 22-6** p. 1049

#### PE 22-6B Income statement with variances

ORI 5



Prepare a 2016 income statement through gross profit for Dvorak Company, using the variance data in Practice Exercises 22-1B, 22-2B, 22-3B, and 22-4B. Assume Dvorak sold 1,000 units at \$90 per unit.

#### **EE 22-7** p. 1051

#### PE 22-7A Activity inputs and outputs

OBJ. 6



ME HOW

The following are inputs and outputs to the copying process of a copy shop:

Number of employee errors

Number of times paper supply runs out

Copy machine downtime (broken)

Number of pages copied per hour

Number of customer complaints

Percent jobs done on time

Identify whether each is an input or output to the copying process.

#### **EE 22-7** p. 1051

#### **PE 22-7B** Activity inputs and outputs

OBJ. 6

The following are inputs and outputs to the cooking process of a restaurant:

Number of times ingredients are missing

Number of customer complaints

Number of hours kitchen equipment is down for repairs

Number of server order mistakes

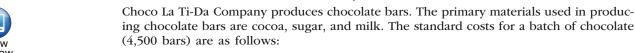
Percent of meals prepared on time

Number of unexpected cook absences

Identify whether each is an input or output to the cooking process.

#### Exercises

#### EX 22-1 Standard direct materials cost per unit



Ingredient	Quantity	Price
Cocoa	510 lbs.	\$1.50 per lb.
Sugar	160 lbs.	\$0.50 per lb.
Milk	100 gal.	\$3.25 per gal.

Determine the standard direct materials cost per bar of chocolate.



#### EX 22-2 Standard product cost

OBJ. 2

Wood You Lie To Me Furniture Company manufactures designer home furniture. Wood You Lie To Me uses a standard cost system. The direct labor, direct materials, and factory overhead standards for an unfinished dining room table are as follows:

Direct labor:	standard rate	\$24.00 per hr.
	standard time per unit	4.0 hrs.
Direct materials (oak):	standard price	\$22.00 per bd. ft.
	standard quantity	32 bd. ft.
Variable factory overhead:	standard rate	\$3.00 per direct labor hr.
Fixed factory overhead:	standard rate	\$2.00 per direct labor hr.

- a. Determine the standard cost per dining room table.
- b. Why would Wood You Lie To Me Furniture Company use a standard cost system?

#### EX 22-3 Budget performance report

OBJ. 2

✓ b. Direct labor cost variance, \$580 F





Genie in a Bottle Company (GBC) manufactures plastic two-liter bottles for the beverage industry. The cost standards per 100 two-liter bottles are as follows:

Cost Category	Standard Cost per 100 Two-Liter Bottles
Direct labor	\$ 2.00
Direct materials	9.10
Factory overhead	0.55
Total	\$11.65

At the beginning of July, GBC management planned to produce 400,000 bottles. The actual number of bottles produced for July was 406,000 bottles. The actual costs for July of the current year were as follows:

Cost Category	Actual Cost for the Month Ended July 31
Direct labor	\$ 7,540
Direct materials	35,750
Factory overhead	2,680
Total	\$45,970

- a. Prepare the July manufacturing standard cost budget (direct labor, direct materials, and factory overhead) for GBC, assuming planned production.
- b. Prepare a budget performance report for manufacturing costs, showing the total cost variances for direct materials, direct labor, and factory overhead for July.
- c. Interpret the budget performance report.

#### **EX 22-4** Direct materials variances

OBJ. 3

The following data relate to the direct materials cost for the production of 4,000 automobile tires:

Actual: 72,500 lbs. at \$3.30 Standard: 75,160 lbs. at \$3.15

- a. Determine the direct materials price variance, direct materials quantity variance, and total direct materials cost variance.
- b. To whom should the variances be reported for analysis and control?

### ✓ Quantity variance, The

\$300 U

✓ a. Price variance,

\$10,875 U

ME HOW





#### **EX 22-5** Direct materials variances

OBJ. 3

The Silicone Engine Inc. produces wrist-worn tablet computers. The company uses Thin Film Crystal (TFC) LCD displays for its products. Each tablet uses one display. The company produced 580 tablets during December. However, due to LCD defects, the company actually used 600 LCD displays during December. Each display has a standard cost of \$15.00. Six hundred LCD displays were purchased for December production at a cost of \$8,550.

Determine the price variance, quantity variance, and total direct materials cost variance for December.

#### EX 22-6 Standard direct materials cost per unit from variance data

OBJ. 2, 3

The following data relating to direct materials cost for October of the current year are taken from the records of Good Clean Fun Inc., a manufacturer of organic toys:

Quantity of direct materials used	3,000 lbs.
Actual unit price of direct materials	\$5.50 per lb.
Units of finished product manufactured	1,400 units
Standard direct materials per unit of finished product	2 lbs.
Direct materials quantity variance—unfavorable	\$1,000
Direct materials price variance—unfavorable	\$1,500

Determine the standard direct materials cost per unit of finished product, assuming that there was no inventory of work in process at either the beginning or the end of the month.



#### EX 22-7 Standard product cost, direct materials variance

**OBJ. 2, 3** 

H.J. Heinz Company uses standards to control its materials costs. Assume that a batch of ketchup (3,128 pounds) has the following standards:

	<b>Standard Quantity</b>	<b>Standard Price</b>
Whole tomatoes	4,000 lbs.	\$ 0.60 per lb.
Vinegar	260 gal.	2.25 per gal.
Corn syrup	25 gal.	28.00 per gal.
Salt	100 lbs.	2.25 per lb.

The actual materials in a batch may vary from the standard due to tomato characteristics. Assume that the actual quantities of materials for batch K-111 were as follows:

4,250 lbs. of tomatoes 275 gal. of vinegar 22 gal. of corn syrup 90 lbs. of salt

- a. Determine the standard unit materials cost per pound for a standard batch.
- b. Determine the direct materials quantity variance for batch K-111. Round your answer to the nearest cent.

#### **EX 22-8** Direct labor variances

OBJ. 3

The following data relate to labor cost for production of 20,000 cellular telephones:

Actual: 8,450 hrs. at \$22.50 Standard: 8,400 hrs. at \$23.00

- a. Determine the direct labor rate variance, direct labor time variance, and total direct labor cost variance.
- b. Discuss what might have caused these variances.

#### **EX 22-9** Direct labor variances

**OBJ. 3, 5** 

Reincarnation Bicycle Company manufactures commuter bicycles from recycled materials. The following data for April of the current year are available:

Quantity of direct labor used	1,530 hrs.
Actual rate for direct labor	\$17.00 per hr.
Bicycles completed in April	500
Standard direct labor per bicycle	3 hrs.
Standard rate for direct labor	\$17.50 per br

- a. Determine the direct labor rate variance, time variance, and total direct labor cost variance.
- b. How much direct labor should be debited to Work in Process?

SHOW ME HOW

\$525 U

✓ a. Rate variance,

✓ a. Time variance,

\$4,225 F

ME HOW

#### EX 22-10 Direct labor variances

OBJ. 3

The Greeson Clothes Company produced 25,000 units during June of the current year. The Cutting Department used 6,380 direct labor hours at an actual rate of \$10.90 per hour. The Sewing Department used 9,875 direct labor hours at an actual rate of \$11.12 per hour. Assume there were no work in process inventories in either department at the beginning or end of the month. The standard labor rate is \$11.00. The standard labor time for the Cutting and Sewing departments is 0.25 hour and 0.4 hour per unit, respectively.

- a. Determine the direct labor rate, direct labor time, and total direct labor cost variance for the (1) Cutting Department and (2) Sewing Department.
- b. Interpret your results.

✓ a. Cutting
Department rate
variance, \$638
favorable

#### **EX 22-11** Direct labor standards for nonmanufacturing expenses

OBJ. 3

✓ a. \$2,400

Englert Hospital began using standards to evaluate its Admissions Department. The standard was broken into two types of admissions as follows:

Type of Admission	Standard Time to Complete Admission Record
Unscheduled admission	30 min.
Scheduled admission	15 min.

The unscheduled admission took longer because name, address, and insurance information needed to be determined and verified at the time of admission. Information was collected on scheduled admissions prior to the admissions, which was less time consuming.

The Admissions Department employs four full-time people (40 productive hours per week, with no overtime) at \$15 per hour. For the most recent week, the department handled 140 unscheduled and 350 scheduled admissions.

- a. How much was actually spent on labor for the week?
- b. What are the standard hours for the actual volume for the week?
- c. Calculate a time variance, and report how well the department performed for the week.

#### **EX 22-12** Direct labor standards for a service company

OBJ. 2, 3



Assume that the sorting operators are temporary employees. The union contract requires that temporary employees be hired for one month at a time. Each temporary employee is hired to work 160 hours in the month.

- a. How many temporary employees should the manager hire for December?
- b. If each temporary employee earns a standard \$16.40 per hour, what would be the labor time variance if the actual number of additional letters sorted in December was 23,895,000?

#### **EX 22-13** Direct labor variances for a service company

Hit-n-Run Food Trucks, Inc. owns and operates food trucks (mobile kitchens) throughout the west coast. The company's employees have varying wage levels depending on their experience and length of time with the company. Employees work eight hour shifts and are assigned to a truck each day based on labor needs to support the daily menu. One of their trucks, Jose O'Brien's Mobile Fiesta, specializes in Irish-Mexican fusion cuisine. The truck offers a single menu item which changes daily. On November 11, the truck prepared 200 of its most popular item, the Irish Breakfast Enchiladas. The following data are available for that day:

Quantity of direct labor used	24 hrs.
(3 employees, working 8 hour shifts)	
Actual rate for direct labor	\$15.00 per hr.
Standard direct labor per meal	0.1 hr.
Standard rate for direct labor	\$15.50 per hr.

- a. Determine the direct labor rate variance, direct labor time variance, and the total direct labor cost variance.
- b. Discuss what might have caused these variances.









✓ Direct materials quantity variance, \$1,100 U



#### EX 22-14 Direct materials and direct labor variances

OBJ. 3

At the beginning of June, Bezco Toy Company budgeted 5,000 toy action figures to be manufactured in June at standard direct materials and direct labor costs as follows:

Direct materials	\$50,000
Direct labor	36,000
Total	\$86,000

The standard materials price is \$4.00 per pound. The standard direct labor rate is \$18.00 per hour. At the end of June, the actual direct materials and direct labor costs were as follows:

Actual direct materials	\$49,600
Actual direct labor	34,020
Total	\$83,620

There were no direct materials price or direct labor rate variances for June. In addition, assume no changes in the direct materials inventory balances in June. Bezco Toy Company actually produced 4,850 units during June.

Determine the direct materials quantity and direct labor time variances.

#### EX 22-15 Flexible overhead budget

OBJ. 4

Leno Manufacturing Company prepared the following factory overhead cost budget for the Press Department for October of the current year, during which it expected to require 20,000 hours of productive capacity in the department:

✓ Total factory overhead, 22,000 hrs., \$443,600

Variable overhead cost:

Indirect factory labor \$180,000

Power and light 12,000

Indirect materials 64,000

Total variable overhead cost \$256,000

Fixed overhead cost:

Supervisory salaries \$ 80,000

Depreciation of plant and equipment 50,000

Insurance and property taxes 32,000

Total fixed overhead cost 162,000
Total factory overhead cost \$418,000

Assuming that the estimated costs for November are the same as for October, prepare a flexible factory overhead cost budget for the Press Department for November for 18,000, 20,000, and 22,000 hours of production.

#### EX 22-16 Flexible overhead budget

OBJ. 4

Wiki Wiki Company has determined that the variable overhead rate is \$4.50 per direct labor hour in the Fabrication Department. The normal production capacity for the Fabrication Department is 10,000 hours for the month. Fixed costs are budgeted at \$60,000 for the month.

- a. Prepare a monthly factory overhead flexible budget for 9,000, 10,000, and 11,000 hours of production.
- b. How much overhead would be applied to production if 9,000 hours were used in the department during the month?

#### ✓ Volume variance, \$6,000 U

#### **EX 22-17** Factory overhead cost variances

**OBJ. 4** 

The following data relate to factory overhead cost for the production of 10,000 computers:

Actual: Variable factory overhead \$262,000 Fixed factory overhead 90,000 Standard: 14,000 hrs. at \$25 350,000

If productive capacity of 100% was 15,000 hours and the total factory overhead cost budgeted at the level of 14,000 standard hours was \$356,000, determine the variable factory overhead controllable variance, fixed factory overhead volume variance, and total factory overhead cost variance. The fixed factory overhead rate was \$6.00 per hour.

#### EX 22-18 Factory overhead cost variances

**OBJ. 4** 

Blumen Textiles Corporation began April with a budget for 90,000 hours of production in the Weaving Department. The department has a full capacity of 100,000 hours under normal business conditions. The budgeted overhead at the planned volumes at the beginning of April was as follows:

Variable overhead	\$540,000
Fixed overhead	240,000
Total	\$780,000

The actual factory overhead was \$782,000 for April. The actual fixed factory overhead was as budgeted. During April, the Weaving Department had standard hours at actual production volume of 92,500 hours.

- a. Determine the variable factory overhead controllable variance.
- b. Determine the fixed factory overhead volume variance.

#### EX 22-19 Factory overhead variance corrections

**OBJ.** 4

The data related to Shunda Enterprises Inc.'s factory overhead cost for the production of 100,000 units of product are as follows:

Actual:	Variable factory overhead	\$458,000
	Fixed factory overhead	494,000
Standard:	132,000 hrs. at \$7.30 (\$3.50 for variable factory overhead)	963,600

Productive capacity at 100% of normal was 130,000 hours, and the factory overhead cost budgeted at the level of 132,000 standard hours was \$956,000. Based on these data, the chief cost accountant prepared the following variance analysis:

Variable factory overhead controllable variance:

Actual variable factory overhead cost incurred	\$458,000	
Budgeted variable factory overhead for 132,000 hours	462,000	
Variance favorable		ċ 400

Variance—favorable -\$ 4,000

Fixed factory overhead volume variance:

Normal productive capacity at 100% 130,000 hrs. Standard for amount produced  $\frac{132,000}{2,000}$  Productive capacity not used 2,000 hrs. Standard variable factory overhead rate  $\times$  \$7.30

 $\begin{tabular}{lll} Variance-unfavorable & 14,600 \\ \hline Total factory overhead cost variance-unfavorable & $10,600 \\ \hline \end{tabular}$ 

Identify the errors in the factory overhead cost variance analysis.

✓ a. \$13,000 F



#### EX 22-20 Factory overhead cost variance report

OBJ. 4

✓ Net controllable variance, \$900 U



Tannin Products Inc. prepared the following factory overhead cost budget for the Trim Department for July of the current year, during which it expected to use 20,000 hours for production:

Variable overhead cost:		
Indirect factory labor	\$46,000	
Power and light	12,000	
Indirect materials	20,000	
Total variable overhead cost		\$ 78,000
Fixed overhead cost:		
Supervisory salaries	\$54,500	
Depreciation of plant and equipment	40,000	
Insurance and property taxes	35,500	
Total fixed overhead cost		130,000
Total factory overhead cost		\$208,000

Tannin has available 25,000 hours of monthly productive capacity in the Trim Department under normal business conditions. During July, the Trim Department actually used 22,000 hours for production. The actual fixed costs were as budgeted. The actual variable overhead for July was as follows:

		_		
A ctual	variable	factory	overhead	coct.
Actual	variable	Tactor v	Overneau	COSt.

Indirect factory labor	\$49,700
Power and light	13,000
Indirect materials	24,000
Total variable cost	\$86,700

Construct a factory overhead cost variance report for the Trim Department for July.

#### **EX 22-21** Recording standards in accounts

OBJ. 5

Cioffi Manufacturing Company incorporates standards in its accounts and identifies variances at the time the manufacturing costs are incurred. Journalize the entries to record the following transactions:

- a. Purchased 2,450 units of copper tubing on account at \$52.00 per unit. The standard price is \$48.50 per unit.
- b. Used 1,900 units of copper tubing in the process of manufacturing 200 air conditioners. Ten units of copper tubing are required, at standard, to produce one air conditioner.

#### **EX 22-22** Recording standards in accounts

OBJ. 5

The Assembly Department produced 5,000 units of product during March. Each unit required 2.20 standard direct labor hours. There were 11,500 actual hours used in the Assembly Department during March at an actual rate of \$17.60 per hour. The standard direct labor rate is \$18.00 per hour. Assuming direct labor for a month is paid on the fifth day of the following month, journalize the direct labor in the Assembly Department on March 31.

#### **EX 22-23** Income statement indicating standard cost variances

OBJ. 5

The following data were taken from the records of Griggs Company for December 2016:

Administrative expenses	\$100,800
Cost of goods sold (at standard)	550,000
Direct materials price variance—unfavorable	1,680
Direct materials quantity variance—favorable	560
Direct labor rate variance—favorable	1,120
Direct labor time variance—unfavorable	490
Variable factory overhead controllable variance—favorable	210
Fixed factory overhead volume variance—unfavorable	3,080
Interest expense	2,940
Sales	868,000
Selling expenses	125,000

Prepare an income statement for presentation to management.

✓ Income before income tax, \$85,900

#### EX 22-24 Nonfinancial performance measures

OBJ. 6

Diamond Inc. is an Internet retailer of woodworking equipment. Customers order woodworking equipment from the company, using an online catalog. The company processes these orders and delivers the requested product from its warehouse. The company wants to provide customers with an excellent purchase experience in order to expand the business through favorable word-of-mouth advertising and to drive repeat business. To help monitor performance, the company developed a set of performance measures for its order placement and delivery process:

Average computer response time to customer "clicks"

Dollar amount of returned goods

Elapsed time between customer order and product delivery

Maintenance dollars divided by hardware investment

Number of customer complaints divided by the number of orders

Number of misfilled orders divided by the number of orders

Number of orders per warehouse employee

Number of page faults or errors due to software programming errors

Number of software fixes per week

Server (computer) downtime

Training dollars per programmer

- a. For each performance measure, identify it as either an input or output measure related to the "order placement and delivery" process.
- b. Provide an explanation for each performance measure.

#### EX 22-25 Nonfinancial performance measures

**OBJ. 6** 

Alpha University wishes to monitor the efficiency and quality of its course registration process.

- a. Identify three input and three output measures for this process.
- b. Why would Alpha University use nonfinancial measures for monitoring this process?

### **Problems: Series A**

#### PR 22-1A Direct materials and direct labor variance analysis

OBJ. 2, 3

Fancy Fixture Company manufactures faucets in a small manufacturing facility. The faucets are made from brass. Manufacturing has 100 employees. Each employee presently provides 40 hours of labor per week. Information about a production week is as follows:

Standard wage per hr.	\$21.00
Standard labor time per faucet	20 min.
Standard number of lbs. of brass	5 lbs.
Standard price per lb. of brass	\$2.80
Actual price per lb. of brass	\$2.72
Actual lbs. of brass used during the week	59,875 lbs.
Number of faucets produced during the week	11,820
Actual wage per hr.	\$21.40
Actual hrs. for the week	4,000 hrs.

#### **Instructions**

Determine (a) the standard cost per unit for direct materials and direct labor; (b) the direct materials price variance, direct materials quantity variance, and total direct materials cost variance; and (c) the direct labor rate variance, direct labor time variance, and total direct labor cost variance.

#### ✓ c. Direct labor time variance, \$1,260 U



## materials quantity

#### PR 22-2A Flexible budgeting and variance analysis

OBJ. 1, 2, 3

I Love My Chocolate Company makes dark chocolate and light chocolate. Both products require cocoa and sugar. The following planning information has been made available:

✓ 1. a. Direct

variance, \$625 F

#### **Standard Amount per Case**

	Dark Chocolate	Light Chocolate	Standard Price per Pound
Cocoa	12 lbs.	8 lbs.	\$7.25
Sugar	10 lbs.	14 lbs.	1.40
Standard labor time	0.50 hr.	0.60 hr.	
	Dark Cl	nocolate	Light Chocolate

	Dark Chocolate	Light Chocolate
Planned production	4,700 cases	11,000 cases
Standard labor rate	\$15.50 per hr.	\$15.50 per hr.

I Love My Chocolate Company does not expect there to be any beginning or ending inventories of cocoa or sugar. At the end of the budget year, I Love My Chocolate Company had the following actual results:

	Dark Chocolate	Light Chocolate
Actual production (cases)	5,000	10,000
	<b>Actual Price per Pound</b>	<b>Actual Pounds Purchased and Used</b>
Cocoa	\$7.33	140,300
Sugar	1.35	188,000
	<b>Actual Labor Rate</b>	<b>Actual Labor Hours Used</b>
Dark chocolate	\$15.25 per hr.	2,360
Light chocolate	15.80 per hr.	6,120

#### **Instructions**

- 1. Prepare the following variance analyses for both chocolates and the total, based on the actual results and production levels at the end of the budget year:
  - a. Direct materials price, quantity, and total variance.
  - b. Direct labor rate, time, and total variance.
- 2. Why are the standard amounts in part (1) based on the actual production for the year instead of the planned production for the year?

#### PR 22-3A Direct materials, direct labor, and factory overhead cost variance analysis

Adamantane Inc. processes a base chemical into plastic. Standard costs and actual costs for direct materials, direct labor, and factory overhead incurred for the manufacture of 15,000 units of product were as follows:

	Standard Costs	<b>Actual Costs</b>
Direct materials	5,000 lbs. at \$50.00	4,950 lbs. at \$50.60
Direct labor	3,000 hrs. at \$25.00 2,945 hrs. at \$25.0	
Factory overhead	Rates per direct labor hr.,	
	based on 100% of normal	
	capacity of 3,200 direct	
	labor hrs.:	
	Variable cost, \$5.50	\$16,680 variable cost
	Fixed cost, \$4.00	\$12,800 fixed cost

Each unit requires 0.2 hour of direct labor.

#### **Instructions**

Determine (a) the direct materials price variance, direct materials quantity variance, and total direct materials cost variance; (b) the direct labor rate variance, direct labor time variance, and total direct labor cost variance; and (c) the variable factory overhead controllable variance, fixed factory overhead volume variance, and total factory overhead cost variance.

✓ c. Controllable variance, \$180 U



## ✓ Controllable variance, \$770 U



General Ledger

#### PR 22-4A Factory overhead cost variance report

OBJ. 4

Tiger Equipment Inc., a manufacturer of construction equipment, prepared the following factory overhead cost budget for the Welding Department for May of the current year. The company expected to operate the department at 100% of normal capacity of 8,400 hours.

Variable costs:		
Indirect factory wages	\$30,240	
Power and light	20,160	
Indirect materials	16,800	
Total variable cost		\$ 67,200
Fixed costs:		
Supervisory salaries	\$20,000	
Depreciation of plant and equipment	36,200	
Insurance and property taxes	15,200	
Total fixed cost		71,400
Total factory overhead cost		\$138,600

During May, the department operated at 8,860 standard hours, and the factory overhead costs incurred were indirect factory wages, \$32,400; power and light, \$21,000; indirect materials, \$18,250; supervisory salaries, \$20,000; depreciation of plant and equipment, \$36,200; and insurance and property taxes, \$15,200.

#### Instructions

Prepare a factory overhead cost variance report for May. To be useful for cost control, the budgeted amounts should be based on 8,860 hours.

#### PR 22-5A Standards for nonmanufacturing expenses

**OBJ. 3, 6** 

CodeHead Software Inc. does software development. One important activity in software development is writing software code. The manager of the WordPro Development Team determined that the average software programmer could write 25 lines of code in an hour. The plan for the first week in May called for 4,650 lines of code to be written on the WordPro product. The WordPro Team has five programmers. Each programmer is hired from an employment firm that requires temporary employees to be hired for a minimum of a 40-hour week. Programmers are paid \$32.00 per hour. The manager offered a bonus if the team could generate more lines for the week, without overtime. Due to a project emergency, the programmers wrote more code in the first week of May than planned. The actual amount of code written in the first week of May was 5,650 lines, without overtime. As a result, the bonus caused the average programmer's hourly rate to increase to \$40.00 per hour during the first week in May.

#### Instructions

- 1. If the team generated 4,650 lines of code according to the original plan, what would have been the labor time variance?
- 2. What was the actual labor time variance as a result of generating 5,650 lines of code?
- 3. What was the labor rate variance as a result of the bonus?
- 4. Are there any performance-related issues that the labor time and rate variances fail to consider? Explain.
- 5. The manager is trying to determine if a better decision would have been to hire a temporary programmer to meet the higher programming demand in the first week of May, rather than paying out the bonus. If another employee was hired from the employment firm, what would have been the labor time variance in the first week?
- 6. Which decision is better, paying the bonus or hiring another programmer?

✓ 3. \$1,600 U

## **Problems: Series B**

#### PR 22-1B Direct materials and direct labor variance analysis

OBJ. 2, 3

✓ c. Rate variance, \$200 F



Lenni Clothing Co. manufactures clothing in a small manufacturing facility. Manufacturing has 25 employees. Each employee presently provides 40 hours of productive labor per week. Information about a production week is as follows:

Standard wage per hr.	\$12.00
Standard labor time per unit	12 min.
Standard number of yds. of fabric per unit	5.0 yds.
Standard price per yd. of fabric	\$5.00
Actual price per yd. of fabric	\$5.10
Actual yds. of fabric used during the week	26,200 yds.
Number of units produced during the week	5,220
Actual wage per hr.	\$11.80
Actual hrs. for the week	1,000 hrs.

#### **Instructions**

Determine (a) the standard cost per unit for direct materials and direct labor; (b) the price variance, quantity variance, and total direct materials cost variance; and (c) the rate variance, time variance, and total direct labor cost variance.

#### PR 22-2B Flexible budgeting and variance analysis

OBJ. 1, 2, 3

I'm Really Cold Coat Company makes women's and men's coats. Both products require filler and lining material. The following planning information has been made available:

#### ✓ 1. a. Direct materials price variance, \$12,220 U



#### Standard Amount per Unit

	Women's Coats	Men's Coats	Standard Price per Unit
Filler	4.0 lbs.	5.20 lbs.	\$2.00 per lb.
Liner	7.00 yds.	9.40 yds.	8.00 per yd.
Standard labor time	0.40 hr.	0.50 hr.	
	Women's	Coats	Men's Coats
Planned production	5,000 un	5,000 units	
Standard labor rate	\$14.00 pc	\$14.00 per hr.	

I'm Really Cold Coat Company does not expect there to be any beginning or ending inventories of filler and lining material. At the end of the budget year, I'm Really Cold Coat Company experienced the following actual results:

	Women's Coats	Men's Coats	
Actual production	4,400	5,800	
	<b>Actual Price per Unit</b>	<b>Actual Quantity Purchased and Used</b>	
Filler	\$1.90 per lb.	48,000	
Liner	8.20 per yd.	85,100	
	<b>Actual Labor Rate</b>	<b>Actual Labor Hours Used</b>	
Women's coats	\$14.10 per hr.	1,825	
Men's coats	13.30 per hr.	2,800	

The expected beginning inventory and desired ending inventory were realized.

#### **Instructions**

- 1. Prepare the following variance analyses for both coats and the total, based on the actual results and production levels at the end of the budget year:
  - a. Direct materials price, quantity, and total variance.
  - b. Direct labor rate, time, and total variance.
- 2. Why are the standard amounts in part (1) based on the actual production at the end of the year instead of the planned production at the beginning of the year?

OBJ. 3, 4

## PR 22-3B Direct materials, direct labor, and factory overhead cost variance analysis

✓ a. Direct materials price variance, \$10,100 U



Road Gripper Tire Co. manufactures automobile tires. Standard costs and actual costs for direct materials, direct labor, and factory overhead incurred for the manufacture of 4,160 tires were as follows:

	Standard Costs	<b>Actual Costs</b>
Direct materials	100,000 lbs. at \$6.40	101,000 lbs. at \$6.50
Direct labor	2,080 hrs. at \$15.75	2,000 hrs. at \$15.40
Factory overhead	Rates per direct labor hr.,	
	based on 100% of normal	
	capacity of 2,000 direct	
	labor hrs.:	
	Variable cost, \$4.00	\$8,200 variable cost
	Fixed cost, \$6.00 \$12,000 fixed cost	

Each tire requires 0.5 hour of direct labor.

#### **Instructions**

Determine (a) the direct materials price variance, direct materials quantity variance, and total direct materials cost variance; (b) the direct labor rate variance, direct labor time variance, and total direct labor cost variance; and (c) the variable factory overhead controllable variance, fixed factory overhead volume variance, and total factory overhead cost variance.

#### PR 22-4B Factory overhead cost variance report

OBJ. 4

Feeling Better Medical Inc., a manufacturer of disposable medical supplies, prepared the following factory overhead cost budget for the Assembly Department for October of the current year. The company expected to operate the department at 100% of normal capacity of 30,000 hours.

#### Variable costs:

Indirect factory wages	\$247,500	
Power and light	189,000	
Indirect materials	52,500	
Total variable cost		\$489,000
Fixed costs:		
Supervisory salaries	\$126,000	
Depreciation of plant and equipment	70,000	
Insurance and property taxes	44,000	
Total fixed cost		240,000
Total factory overhead cost		\$729,000

During October, the department operated at 28,500 hours, and the factory overhead costs incurred were indirect factory wages, \$234,000; power and light, \$178,500; indirect materials, \$50,600; supervisory salaries, \$126,000; depreciation of plant and equipment, \$70,000; and insurance and property taxes, \$44,000.

#### Instructions

Prepare a factory overhead cost variance report for October. To be useful for cost control, the budgeted amounts should be based on 28,500 hours.

#### PR 22-5B Standards for nonmanufacturing expenses for a service company

OBJ. 3, 6

The Radiology Department provides imaging services for Emergency Medical Center. One important activity in the Radiology Department is transcribing digitally recorded analyses of images into a written report. The manager of the Radiology Department determined that the average transcriptionist could type 700 lines of a report in an hour. The plan for the first week in May called for 81,900 typed lines to be written. The Radiology Department has three transcriptionists. Each transcriptionist is hired from an employment firm that requires temporary employees to be hired for a minimum of a 40-hour week. Transcriptionists are

(Continued)

✓ Controllable variance, \$1,450 F



General Ledger

√ 2. \$161 F



paid \$23.00 per hour. The manager offered a bonus if the department could type more lines for the week, without overtime. Due to high service demands, the transcriptionists typed more lines in the first week of May than planned. The actual amount of lines typed in the first week of May was 88,900 lines, without overtime. As a result, the bonus caused the average transcriptionist hourly rate to increase to \$30.00 per hour during the first week in May.

#### **Instructions**

- 1. If the department typed 81,900 lines according to the original plan, what would have been the labor time variance?
- 2. What was the labor time variance as a result of typing 88,900 lines?
- 3. What was the labor rate variance as a result of the bonus?
- 4. The manager is trying to determine if a better decision would have been to hire a temporary transcriptionist to meet the higher typing demands in the first week of May, rather than paying out the bonus. If another employee was hired from the employment firm, what would have been the labor time variance in the first week?
- 5. Which decision is better, paying the bonus or hiring another transcriptionist?
- 6. Are there any performance-related issues that the labor time and rate variances fail to consider? Explain.

## **Comprehensive Problem 5**

Genuine Spice Inc. began operations on January 1, 2016. The company produces eight-ounce bottles of hand and body lotion called *Eternal Beauty*. The lotion is sold wholesale in 12-bottle cases for \$100 per case. There is a selling commission of \$20 per case. The January direct materials, direct labor, and factory overhead costs are as follows:

	DI	RECT MATERIALS	5	
	Cost Behavior	Units per Case	Cost per Unit	Direct Materials Cost per Case
Cream base	Variable	100 ozs.	\$0.02	\$ 2.00
Natural oils	Variable	30 ozs.	0.30	9.00
Bottle (8-oz.)	Variable	12 bottles	0.50	6.00
				\$17.00

DIRECT LABOR				
Department	Cost Behavior	Time per Case	Labor Rate per Hour	Direct Labor Cost per Case
Mixing	Variable	20 min.	\$18.00	\$6.00
Filling	Variable	_ <u>5</u> 25 min.	14.40	1.20 \$7.20

FACTORY OVERHEAD			
	Cost Behavior	<b>Total Cost</b>	
Utilities	Mixed	\$ 600	
Facility lease	Fixed	14,000	
Equipment depreciation	Fixed	4,300	
Supplies	Fixed	660	
		\$19,560	

#### Part A—Break-Even Analysis

The management of Genuine Spice Inc. wishes to determine the number of cases required to break even per month. The utilities cost, which is part of factory overhead, is a mixed

cost. The following information was gathered from the first six months of operation regarding this cost:

2016	<b>Case Production</b>	<b>Utility Total Cost</b>
January	500	\$600
February	800	660
March	1,200	740
April	1,100	720
May	950	690
June	1.025	705

#### Instructions

- 1. Determine the fixed and variable portion of the utility cost using the high-low method.
- 2. Determine the contribution margin per case.
- 3. Determine the fixed costs per month, including the utility fixed cost from part (1).
- 4. Determine the break-even number of cases per month.

#### Part B—August Budgets

During July of the current year, the management of Genuine Spice Inc. asked the controller to prepare August manufacturing and income statement budgets. Demand was expected to be 1,500 cases at \$100 per case for August. Inventory planning information is provided as follows:

Finished Goods Inventory:

	Cases	Cost
Estimated finished goods inventory, August 1, 2016	300	\$12,000
Desired finished goods inventory, August 31, 2016	175	7,000

Materials Inventory:

	Cream Base (ozs.)	Oils (ozs.)	Bottles (bottles)
Estimated materials inventory, August 1, 2016	250	290	600
Desired materials inventory, August 31, 2016	1,000	360	240

There was negligible work in process inventory assumed for either the beginning or end of the month; thus, none was assumed. In addition, there was no change in the cost per unit or estimated units per case operating data from January.

#### **Instructions**

- 5. Prepare the August production budget.
- 6. Prepare the August direct materials purchases budget.
- 7. Prepare the August direct labor budget. Round the hours required for production to the nearest hour.
- 8. Prepare the August factory overhead budget.
- 9. Prepare the August budgeted income statement, including selling expenses.

#### **Part C—August Variance Analysis**

During September of the current year, the controller was asked to perform variance analyses for August. The January operating data provided the standard prices, rates, times, and quantities per case. There were 1,500 actual cases produced during August, which was 250 more cases than planned at the beginning of the month. Actual data for August were as follows:

**✓** 2. \$55.60

✓ 6. Bottles purchased, \$8,070

	Actual Direct Materials Price per Unit	Actual Direct Materials Quantity per Case
Cream base	\$0.016 per oz.	102 ozs.
Natural oils	\$0.32 per oz.	31 ozs.
Bottle (8-oz.)	\$0.42 per bottle	12.5 bottles
	Actual Direct Labor Rate	Actual Direct Labor Time per Case
Mixing	\$18.20	19.50 min.
Filling	14.00	5.60 min.
Actual variable overhead	\$305.00	

The prices of the materials were different than standard due to fluctuations in market prices. The standard quantity of materials used per case was an ideal standard. The Mixing Department used a higher grade labor classification during the month, thus causing the actual labor rate to exceed standard. The Filling Department used a lower grade labor classification during the month, thus causing the actual labor rate to be less than standard.

#### **Instructions**

- 10. Determine and interpret the direct materials price and quantity variances for the three materials.
- 11. Determine and interpret the direct labor rate and time variances for the two departments. Round hours to the nearest hour.
- 12. Determine and interpret the factory overhead controllable variance.
- 13. Determine and interpret the factory overhead volume variance.
- 14. Why are the standard direct labor and direct materials costs in the calculations for parts (10) and (11) based on the actual 1,500-case production volume rather than the planned 1,250 cases of production used in the budgets for parts (6) and (7)?

## Cases & Projects



✓ 11. Mixing time variance, \$216 F

✓ 12. \$5 U

#### CP 22-1 Ethics and professional conduct in business using nonmanufacturing standards

Dash Riprock is a cost analyst with Safe Insurance Company. Safe is applying standards to its claims payment operation. Claims payment is a repetitive operation that could be evaluated with standards. Dash used time and motion studies to identify an ideal standard of 36 claims processed per hour. The Claims Processing Department manager, Henry Tudor, has rejected this standard and has argued that the standard should be 30 claims processed per hour. Henry and Dash were unable to agree, so they decided to discuss this matter openly at a joint meeting with the vice president of operations, who would arbitrate a final decision. Prior to the meeting, Dash wrote the following memo to the VP:

To: Anne Boleyn, Vice President of Operations

From: Dash Riprock

Re: Standards in the Claims Processing Department

As you know, Henry and I are scheduled to meet with you to discuss our disagreement with respect to the appropriate standards for the Claims Processing Department. I have conducted time and motion studies and have determined that the ideal standard is 36 claims processed per hour. Henry argues that 30 claims processed per hour would be more appropriate. I believe he is trying to "pad" the budget with some slack. I'm not sure what he is trying to get away with, but I believe a tight standard will drive efficiency up in his area. I hope you will agree when we meet with you next week.

Discuss the ethical and professional issues in this situation.

#### CP 22-2 Nonfinancial performance measures

The senior management of Tungston Company has proposed the following three performance measures for the company:

- 1. Net income as a percent of stockholders' equity
- 2. Revenue growth
- 3. Employee satisfaction

Management believes these three measures combine both financial and nonfinancial measures and are thus superior to using just financial measures.

What advice would you give Tungston Company for improving its performance measurement system?

#### **CP 22-3** Variance interpretation

You have been asked to investigate some cost problems in the Assembly Department of Ruthenium Electronics Co., a consumer electronics company. To begin your investigation, you have obtained the following budget performance report for the department for the last quarter:

Ruthenium Electronics Co.—Assembly Department Quarterly Budget Performance Report

	Standard Quantity at Standard Rates	Actual Quantity at Standard Rates	Quantity Variances
Direct labor	\$157,500	\$227,500	\$ 70,000 U
Direct materials	297,500	385,000	87,500 U
Total	\$455,000	\$612,500	\$157,500 U

The following reports were also obtained:

#### Ruthenium Electronics Co.—Purchasing Department Quarterly Budget Performance Report

		Actual Quantity at Standard Rates	Actual Quantity at Actual Rates	Price Variance
Dire	et mantoviale			
Dire	ct materials	\$437,500	\$385,000	-\$52,500 F

#### Ruthenium Electronics Co.—Fabrication Department Quarterly Budget Performance Report

	Standard Quantity at Standard Rates	Actual Quantity at Standard Rates	Quantity Variances
Direct labor	\$245,000	\$203,000	-\$42,000 F
Direct materials	140,000	140,000	0
Total	\$385,000	\$343,000	-\$42,000 F

You also interviewed the Assembly Department supervisor. Excerpts from the interview follow:

Q: What explains the poor performance in your department?

A: Listen, you've got to understand what it's been like in this department recently. Lately, it seems no matter how hard we try, we can't seem to make the standards. I'm not sure what is going on, but we've been having a lot of problems lately.

Q: What kind of problems?

A: Well, for instance, all this quarter we've been requisitioning purchased parts from the material storeroom, and the parts just didn't fit together very well. I'm not sure what is going on, but during most of this quarter we've had to scrap and sort purchased parts—just to get our assemblies put together. Naturally, all this takes time and material. And that's not all.

Q: Go on.

A: All this quarter, the work that we've been receiving from the Fabrication Department has been shoddy. I mean, maybe around 20% of the stuff that comes in from Fabrication just can't be assembled. The fabrication is all wrong. As a result, we've had to scrap and rework a lot of the stuff. Naturally, this has just shot our quantity variances.

Interpret the variance reports in light of the comments by the Assembly Department supervisor.

#### **CP 22-4** Variance interpretation

Vanadium Audio Inc. is a small manufacturer of electronic musical instruments. The plant manager received the following variable factory overhead report for the period:

	Actual	Budgeted Variable Factory Overhead at Actual Production	Controllable Variance
Supplies	\$ 42,000	\$ 39,780	\$ 2,220 U
Power and light	52,500	50,900	1,600 U
Indirect factory wages	39,100	30,600	8,500 U
Total	\$133,600	\$121,280	\$12,320 U

Actual units produced: 15,000 (90% of practical capacity)

The plant manager is not pleased with the \$12,320 unfavorable variable factory overhead controllable variance and has come to discuss the matter with the controller. The following discussion occurred:

*Plant Manager:* I just received this factory report for the latest month of operation. I'm not very pleased with these figures. Before these numbers go to headquarters, you and I will need to reach an understanding.

Controller: Go ahead, what's the problem?

Plant Manager: What's the problem? Well, everything. Look at the variance. It's too large. If I understand the accounting approach being used here, you are assuming that my costs are variable to the units produced. Thus, as the production volume declines, so should these costs. Well, I don't believe that these costs are variable at all. I think they are fixed costs. As a result, when we operate below capacity, the costs really don't go down at all. I'm being penalized for costs I have no control over at all. I need this report to be redone to reflect this fact. If anything, the difference between actual and budget is essentially a volume variance. Listen, I know that you're a team player. You really need to reconsider your assumptions on this one.

If you were in the controller's position, how would you respond to the plant manager?

#### CP 22-5 Nonmanufacturing performance measures—government

Internet Project

#### **Group Project**

Municipal governments are discovering that you can control only what you measure. As a result, many municipal governments are introducing nonfinancial performance measures to help improve municipal services. In a group, use the Google search engine to perform a search for "municipal government performance measurement." Google will provide a list of Internet sites that outline various city efforts in using nonfinancial performance measures. As a group, report on the types of measures used by one of the cities from the search.



# Performance Evaluation for Decentralized Operations

## Caterpillar, Inc.

ave you ever wondered why large retail stores like **Macy's**, **JC Penney**, and **Sears** are divided into departments? Organizing into departments allows retailers to provide products and expertise in specialized areas while offering a wide range of products. Departments also allow companies to assign responsibility for financial performance. This information can be used to make product decisions, evaluate operations, and guide company strategy. Strong departmental performance might be attributable to a good department manager, while weak departmental performance may be the result of a product mix that has low customer appeal. By tracking departmental performance, companies can identify and reward excellent performance and take corrective action in departments that are performing poorly.

Like retailers, most businesses organize into operational units, such as divisions and departments. For example, **Caterpillar, Inc.**, manufactures a variety of equipment and machinery and is organized into a number of different

segments, including Construction Industries, Resource Industries, and Power Systems. The Construction Industries Segment manufactures construction equipment such as tractors, dump trucks, and loaders. The Resource Industries segment makes equipment for the mining industry, such as off-highway and mining trucks. The Power Systems segment manufactures equipment that is used to generate power, such as engines and turbines for power plants.

Managers at Caterpillar, Inc., are responsible for running their business segment. Each segment is evaluated on segment profit, which excludes certain expense items from the calculation of profit that are not within the control of the business segment. The company uses segment profit to determine how to allocate resources between business segments and to plan and control the company's operations.

In this chapter, the role of accounting in assisting managers in planning and controlling organizational units, such as departments, divisions, and stores, is described and illustrated.

Learning Objectives	
After studying this chapter, you should be able to:  Describe the advantages and disadvantages of decentralized operations.  Centralized and Decentralized Operations	xample Exercises
Advantages of Decentralization Disadvantages of Decentralization Responsibility Accounting	
Prepare a responsibility accounting report for a cost center.  Responsibility Accounting for Cost Centers	EE 23-1
Prepare responsibility accounting reports for a profit center. Responsibility Accounting for Profit Centers Service Department Charges Profit Center Reporting	EE 23-2 EE 23-3
Compute and interpret the rate of return on investment, the residual income, and the balanced scorecard for an investment center.  Responsibility Accounting for Investment Centers  Rate of Return on Investment  Residual Income  The Balanced Scorecard	EE 23-4 EE 23-5
Describe and illustrate how the market price, negotiated price, and cost price approaches to transfer pricing may be used by decentralized segments of a business.  Transfer Pricing  Market Price Approach  Negotiated Price Approach  Cost Price Approach	EE 23-6
At a Glance	<b>23</b> Page 1094



## **Centralized and Decentralized Operations**

In a *centralized* company, all major planning and operating decisions are made by top management. For example, a one-person, owner-manager-operated company is centralized because all plans and decisions are made by one person. In a small owner-manager-operated business, centralization may be desirable. This is because the owner-manager's close supervision ensures that the business will be operated in the way the owner-manager wishes.

In a *decentralized* company, managers of separate divisions or units are delegated operating responsibility. The division (unit) managers are responsible for planning and controlling the operations of their divisions. Divisions are often structured around products, customers, or regions.

The proper amount of decentralization for a company depends on the company's unique circumstances. For example, in some companies, division managers have authority over all operations, including fixed asset purchases. In other companies, division managers have authority over profits but not fixed asset purchases.

## **Advantages of Decentralization**

For large companies, it is difficult for top management to:

- Maintain daily contact with all operations, and
- Maintain operating expertise in all product lines and services

In such cases, delegating authority to managers closest to the operations usually results in better decisions. These managers often anticipate and react to operating data more quickly than could top management. These managers can also focus their attention on becoming "experts" in their area of operation.

Decentralized operations provide excellent training for managers. Delegating responsibility allows managers to develop managerial experience early in their careers. This helps a company retain managers, some of whom may be later promoted to top management positions.

Managers of decentralized operations often work closely with customers. As a result, they tend to identify with customers and, thus, are often more creative in suggesting operating and product improvements. This helps create good customer relations.

## **Disadvantages of Decentralization**

A primary disadvantage of decentralized operations is that decisions made by one manager may negatively affect the profits of the company. For example, managers of divisions whose products compete with one another might start a price war that decreases the profits of both divisions and, thus, the overall company.

Another disadvantage of decentralized operations is that assets and expenses may be duplicated across divisions. For example, each manager of a product line might have a separate sales force and office support staff.

The advantages and disadvantages of decentralization are summarized in Exhibit 1.

#### **Advantages of Decentralization**

- Allows managers closest to the operations to make decisions
- Provides excellent training for managers
- Allows managers to become experts in their area of operation
- Helps retain managers
- Improves creativity and customer relations

#### **Disadvantages of Decentralization**

- Decisions made by managers may negatively affect the profits of the company
- Duplicates assets and expenses

#### **EXHIBIT 1**

Advantages and Disadvantages of Decentralized Operations

## 

## STEVE JOBS: CENTRALIZED OPERATIONS AT APPLE

Apple Inc.'s meteoric rise from a second-tier computer maker in the early 2000s to the standard for all things technology by the end of the decade was no accident. The company's success was the result of a centralized operation, where Apple CEO Steve Jobs had ultimate control over the company's strategic and operational decisions. As Andrew Keen noted

in his interview of Job's biographer, Walter Isaacson, it was Jobs' "obsessive end-to-end control of products—from chip manufacture to the retail experience—that most defined Steve's remarkable tenure as Apple CEO." This centralized business model also drove Apple's success. Unfortunately, Steve Jobs died in October 2011, creating a void at the top of the company's centralized operation. Since Job's death, Apple has struggled with how to adapt its highly successful centralized business model to the loss of the person that controlled the company's decisions.

Source: A. Keen, "Keen On ... Walter Isaacson: Sometimes It's Nice to Be In The Hands of a Control Freak," AOLTech.com, December 19, 2011.

## **Responsibility Accounting**

In a decentralized business, accounting assists managers in evaluating and controlling their areas of responsibility, called *responsibility centers*. **Responsibility accounting** is the process of measuring and reporting operating data by responsibility center.

Three types of responsibility centers are as follows:

- Cost centers, which have responsibility over costs
- Profit centers, which have responsibility over revenues and costs
- Investment centers, which have responsibility over revenues, costs, and investment in assets



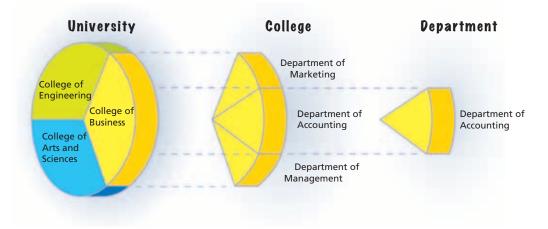
## **Responsibility Accounting for Cost Centers**

A **cost center** manager has responsibility for controlling costs. For example, the supervisor of the Power Department has responsibility for the costs of providing power. A cost center manager does not make decisions concerning sales or the amount of fixed assets invested in the center.

Cost centers may vary in size from a small department to an entire manufacturing plant. In addition, cost centers may exist within other cost centers. For example, an entire university or college could be viewed as a cost center, and each college and department within the university could also be a cost center, as shown in Exhibit 2.

#### **EXHIBIT 2**

#### **Cost Centers in a University**



Responsibility accounting for cost centers focuses on the controlling and reporting of costs. Budget performance reports that report budgeted and actual costs are normally prepared for each cost center.

Exhibit 3 illustrates budget performance reports for the following cost centers:

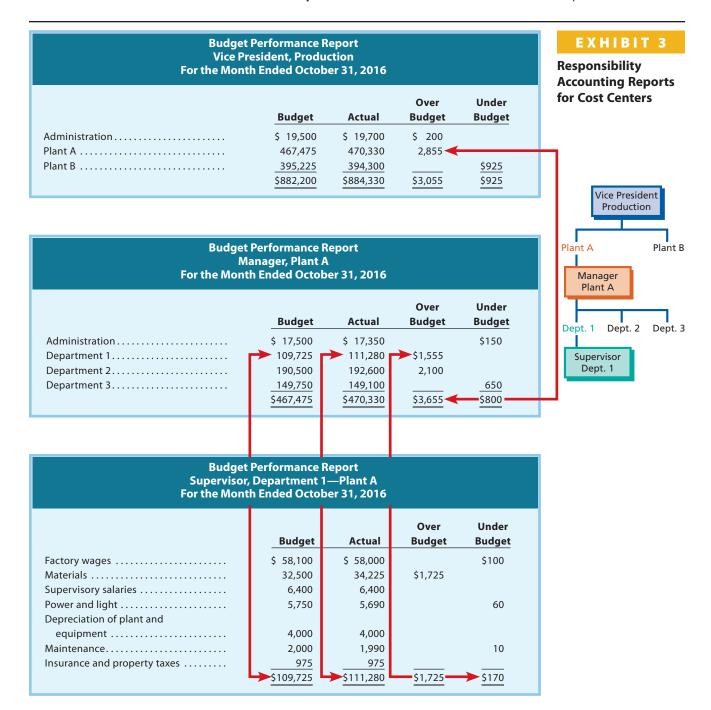
- Vice President, Production
- Manager, Plant A
- Supervisor, Department 1—Plant A

Exhibit 3 shows how cost centers are often linked together within a company. For example, the budget performance report for Department 1—Plant A supports the report for Plant A, which supports the report for the vice president of production.

The reports in Exhibit 3 show the budgeted costs and actual costs along with the differences. Each difference is classified as either *over* budget or *under* budget. Such reports allow cost center managers to focus on areas of significant differences.

For example, the supervisor for Department 1 of Plant A can focus on why the materials cost was over budget. The supervisor might discover that excess materials were scrapped. This could be due to such factors as machine malfunctions, improperly trained employees, or low-quality materials.

As shown in Exhibit 3, responsibility accounting reports are usually more summarized for higher levels of management. For example, the budget performance report for the manager of Plant A shows only administration and departmental data. This report enables the plant manager to identify the departments responsible for major differences. Likewise, the report for the vice president of production summarizes the cost data for each plant.



### Example Exercise 23-1 Budgetary Performance for Cost Center

**OBJ 2** 

Nuclear Power Company's costs were over budget by \$24,000. The company is divided into North and South regions. The North Region's costs were under budget by \$2,000. Determine the amount that the South Region's costs were over or under budget.

### Follow My Example 23-1

\$26,000 over budget (\$24,000 + \$2,000)

Practice Exercises: PE 23-1A, PE 23-1B



## **Responsibility Accounting for Profit Centers**

A **profit center** manager has the responsibility and authority for making decisions that affect revenues and costs and, thus, profits. Profit centers may be divisions, departments, or products.

The manager of a profit center does not make decisions concerning the fixed assets invested in the center. However, profit centers are an excellent training assignment for new managers.

Responsibility accounting for profit centers focuses on reporting revenues, expenses, and income from operations. Thus, responsibility accounting reports for profit centers take the form of income statements.

The profit center income statement should include only revenues and expenses that are controlled by the manager. **Controllable revenues** are revenues earned by the profit center. **Controllable expenses** are costs that can be influenced (controlled) by the decisions of profit center managers.

## **Service Department Charges**

The controllable expenses of profit centers include *direct operating expenses* such as sales salaries and utility expenses. In addition, a profit center may incur expenses provided by internal centralized *service departments*. Examples of such service departments include the following:

- · Research and Development
- Legal
- Telecommunications
- Information and Computer Systems
- Facilities Management
- Purchasing
- Advertising
- Payroll Accounting
- Transportation
- Human Resources

Service department charges are *indirect* expenses to a profit center. They are similar to the expenses that would be incurred if the profit center purchased the services from outside the company. A profit center manager has control over service department expenses if the manager is free to choose how much service is used. In such cases, **service department charges** are allocated to profit centers based on the usage of the service by each profit center.

To illustrate, Nova Entertainment Group (NEG), a diversified entertainment company, is used. NEG has the following two operating divisions organized as profit centers:

- Theme Park Division
- Movie Production Division

The revenues and direct operating expenses for the two divisions follow. The operating expenses consist of direct expenses, such as the wages and salaries of a division's employees.

	Theme Park	Movie Production	
	Division	Division	
Revenues	\$6,000,000	\$2,500,000	
Operating expenses	2,495,000	405,000	

NEG's service departments and the expenses they incurred for the year ended December 31, 2016, are as follows:

Purchasing	\$400,000
Payroll Accounting	255,000
Legal	250,000
Total	\$905,000



Employees of **IBM** speak of "green money" and "blue

money." Green money comes from customers. Blue money comes from providing services to other IBM departments via service department charges. IBM employees note that blue money is easier to earn than green money; yet from the stockholders' perspective, green money is the only money that counts.

An activity base for each service department is used to charge service department expenses to the Theme Park and Movie Production divisions. The activity base for each service department is a measure of the services performed. For NEG, the service department activity bases are as follows:

Department	Activity Base	
Purchasing	Number of purchase requisitions	
Payroll Accounting	Number of payroll checks	
Legal	Number of billed hours	

The use of services by the Theme Park and Movie Production divisions is as follows:

	Service Usage			
Division	Purchasing	Payroll Accounting	Legal	
Theme Park	25,000 purchase requisitions	12,000 payroll checks	100 billed hrs.	
Movie Production	15,000	3,000	900	
Total	40,000 purchase requisitions	15,000 payroll checks	1,000 billed hrs.	

The rates at which services are charged to each division are called *service department charge rates*. These rates are computed as follows:

NEG's service department charge rates are computed as follows:

Purchasing Charge Rate = 
$$\frac{$400,000}{40,000 \text{ purchase requisitions}}$$
 = \$10 per purchase requisition

Payroll Charge Rate =  $\frac{$255,000}{15,000 \text{ payroll checks}}$  = \$17 per payroll check

Legal Charge Rate =  $\frac{$250,000}{1,000 \text{ billed hrs.}}$  = \$250 per hr.

The services used by each division are multiplied by the service department charge rates to determine the service charges for each division, computed as follows:

Service Department Charge = Service Usage × Service Department Charge Rate

Exhibit 4 illustrates the service department charges and related computations for NEG's Theme Park and Movie Production divisions.

#### **Nova Entertainment Group Service Department Charges to NEG Divisions** For the Year Ended December 31, 2016 **Theme Park Movie Production Service Department** Division Division Purchasing (Note A) ..... \$250,000 \$150,000 51,000 204,000 Legal (Note C)..... 25,000 225,000 Total service department charges ..... \$479,000 \$426,000 25,000 purchase requisitions $\times$ \$10 per purchase requisition = \$250,000 15,000 purchase requisitions $\times$ \$10 per purchase requisition = \$150,000 Note B: 12,000 payroll checks $\times$ \$17 per check = \$204,000 3,000 payroll checks $\times$ \$17 per check = \$51,000 Note C: 100 hours $\times$ \$250 per hour = \$25,000 900 hours $\times$ \$250 per hour = \$225,000

#### **EXHIBIT 4**

Service Department Charges to NEG Divisions The differences in the service department charges between the two divisions can be explained by the nature of their operations and, thus, usage of services. For example, the Theme Park Division employs many part-time employees who are paid weekly. As a result, the Theme Park Division requires 12,000 payroll checks and incurs a \$204,000 payroll service department charge ( $12,000 \times \$17$ ). In contrast, the Movie Production Division has more permanent employees who are paid monthly. Thus, the Movie Production Division requires only 3,000 payroll checks and incurs a payroll service department charge of \$51,000 ( $3,000 \times \$17$ ).

### Example Exercise 23-2 Service Department Charges



The centralized legal department of Johnson Company has expenses of \$600,000. The department has provided a total of 2,000 hours of service for the period. The East Division has used 500 hours of legal service during the period, and the West Division has used 1,500 hours. How much should each division be charged for legal services?

#### Follow My Example 23-2

**East Division Service Charge for Legal Department:** 

 $$150,000 = 500 \text{ billed hours} \times ($600,000 \div 2,000 \text{ hours})$ 

**West Division Service Charge for Legal Department:** 

 $$450,000 = 1,500 \text{ billed hours} \times ($600,000 \div 2,000 \text{ hours})$ 

Practice Exercises: PE 23-2A, PE 23-2B

## **Profit Center Reporting**

The divisional income statements for NEG are shown in Exhibit 5.

#### **EXHIBIT 5**

Divisional Income Statements—NEG

Nova Entertainment Group Divisional Income Statements For the Year Ended December 31, 2016		
	Theme Park Division	Movie Production Division
Revenues*	\$6,000,000	\$2,500,000
Operating expenses	2,495,000	405,000
service department charges	\$3,505,000	\$2,095,000
Purchasing	\$ 250,000	\$ 150,000
Payroll Accounting	204,000	51,000
Legal	25,000	225,000
Total service department charges	\$ 479,000	\$ 426,000
Income from operations	\$3,026,000	\$1,669,000
*For a profit center that sells products, the income statement would show: Sales – Cost of goods sold = Gross profit.  The operating expenses would be deducted from the gross profit to get the income from operations before service department charges.		

In evaluating the profit center manager, the income from operations should be compared over time to a budget. However, it should not be compared across profit centers because the profit centers are usually different in terms of size, products, and customers.

## Example Exercise 23-3 Income from Operations for Profit Center

**>**(



Using the data for Johnson Company from Example Exercise 23-2 along with the following data, determine the divisional income from operations for the East and West divisions:

	<b>East Division</b>	<b>West Division</b>
Sales	\$3,000,000	\$8,000,000
Cost of goods sold	1,650,000	4,200,000
Selling expenses	850,000	1,850,000

## Follow My Example 23-3

	<b>East Division</b>	<b>West Division</b>
Sales	\$3,000,000	\$8,000,000
Cost of goods sold	1,650,000	4,200,000
Gross profit	\$1,350,000	\$3,800,000
Selling expenses	850,000	1,850,000
Income from operations before service department charges	\$ 500,000	\$1,950,000
Service department charges	150,000	450,000
Income from operations	\$ 350,000	\$1,500,000

Practice Exercises: PE 23-3A, PE 23-3B

center.

# Responsibility Accounting for Investment Centers

An **investment center** manager has the responsibility and the authority to make decisions that affect not only costs and revenues but also the assets invested in the center. Investment centers are often used in diversified companies organized by divisions. In such cases, the divisional manager has authority similar to that of a chief operating officer or president of a company.

Because investment center managers have responsibility for revenues and expenses, *income from operations* is part of investment center reporting. In addition, because the manager has responsibility for the assets invested in the center, the following two additional measures of performance are used:

- Rate of return on investment
- Residual income

To illustrate, DataLink Inc., a cellular phone company with three regional divisions, is used. Condensed divisional income statements for the Northern, Central, and Southern divisions of DataLink are shown in Exhibit 6.

(OBJ		Compute and	
	interpret the		
	rate of i	return on	
	investm	ent, the residual	
	income	, and the balanced	
	scorecard for an investmen		

#### DataLink Inc. **Divisional Income Statements** For the Year Ended December 31, 2016 Northern Central Southern Division Division Division Revenues ..... \$560,000 \$672,000 \$750,000 Operating expenses..... 336,000 470,400 562,500 Income from operations before service department charges ..... \$224,000 \$201,600 \$187,500 154,000 117,600 112,500 Income from operations..... \$ 70,000 \$ 84,000 \$ 75,000

#### **EXHIBIT 6**

Divisional Income Statements— DataLink Inc. Using only income from operations, the Central Division is the most profitable division. However, income from operations does not reflect the amount of assets invested in each center. For example, the Central Division could have twice as many assets as the Northern Division. For this reason, performance measures that consider the amount of invested assets, such as the rate of return on investment and residual income, are used.

## **Rate of Return on Investment**

Because investment center managers control the amount of assets invested in their centers, they should be evaluated based on the use of these assets. One measure that considers the amount of assets invested is the **rate of return on investment (ROI)** or *rate of return on assets*. It is computed as follows:

The rate of return on investment is useful because the three factors subject to control by divisional managers (revenues, expenses, and invested assets) are considered. The higher the rate of return on investment, the better the division is using its assets to generate income. In effect, the rate of return on investment measures the income (return) on each dollar invested. As a result, the rate of return on investment can be used as a common basis for comparing divisions with each other.

To illustrate, the invested assets of DataLink's three divisions are as follows:

	Invested Assets
Northern Division	\$350,000
Central Division	700,000
Southern Division	500,000

Using the income from operations for each division shown in Exhibit 6, the rate of return on investment for each division is computed as follows:

Northern Division:

Rate of Return on Investment = 
$$\frac{\text{Income from Operations}}{\text{Invested Assets}} = \frac{\$70,000}{\$350,000} = 20\%$$

Central Division:

Rate of Return on Investment = 
$$\frac{\text{Income from Operations}}{\text{Invested Assets}} = \frac{\$84,000}{\$700,000} = 12\%$$

Southern Division:

Rate of Return on Investment = 
$$\frac{\text{Income from Operations}}{\text{Invested Assets}} = \frac{\$75,000}{\$500,000} = 15\%$$

Although the Central Division generated the largest income from operations, its rate of return on investment (12%) is the lowest. Hence, relative to the assets invested, the Central Division is the least profitable division. In comparison, the rate of return on investment of the Northern Division is 20%, and the Southern Division is 15%.

To analyze differences in the rate of return on investment across divisions, the **DuPont formula** for the rate of return on investment is often used.¹ The DuPont formula views the rate of return on investment as the product of the following two factors:

- Profit margin, which is the ratio of income from operations to sales.
- Investment turnover, which is the ratio of sales to invested assets.

¹The DuPont formula was created by a financial executive of E. I. du Pont de Nemours and Company in 1919.

Using the DuPont formula, the rate of return on investment is expressed as follows:

Rate of Return on Investment = Profit Margin  $\times$  Investment Turnover

Rate of Return on Investment 
$$=\frac{\text{Income from Operations}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Invested Assets}}$$

The DuPont formula is useful in evaluating divisions. This is because the profit margin and the investment turnover reflect the following underlying operating relationships of each division:

- Profit margin indicates operating profitability by computing the rate of profit earned on each sales dollar.
- Investment turnover indicates operating efficiency by computing the number of sales dollars generated by each dollar of invested assets.

If a division's profit margin increases, and all other factors remain the same, the division's rate of return on investment will increase. For example, a division might add more profitable products to its sales mix and, thus, increase its operating profit, profit margin, and rate of return on investment.

If a division's investment turnover increases, and all other factors remain the same, the division's rate of return on investment will increase. For example, a division might attempt to increase sales through special sales promotions and thus increase operating efficiency, investment turnover, and rate of return on investment.

The rate of return on investment, profit margin, and investment turnover operate in relationship to one another. Specifically, more income can be earned by either increasing the investment turnover, increasing the profit margin, or both.

Using the DuPont formula yields the same rate of return on investment for each of DataLink's divisions, computed as follows:

Rate of Return on Investment = 
$$\frac{|\text{Income from Operations}|}{|\text{Sales}|} \times \frac{|\text{Sales}|}{|\text{Invested Assets}|}$$

Northern Division:

Rate of Return on Investment =  $\frac{$70,000}{$560,000} \times \frac{$560,000}{$350,000} = 12.5\% \times 1.6 = 20\%$ 

Central Division:

Rate of Return on Investment =  $\frac{$84,000}{$672,000} \times \frac{$672,000}{$700,000} = 12.5\% \times 0.96 = 12\%$ 

Southern Division:

Rate of Return on Investment =  $\frac{$75,000}{$750,000} \times \frac{$750,000}{$500,000} = 10\% \times 1.5 = 15\%$ 

The Northern and Central divisions have the same profit margins of 12.5%. However, the Northern Division's investment turnover of 1.6 is larger than that of the Central Division's turnover of 0.96. By using its invested assets more efficiently, the Northern Division's rate of return on investment of 20% is 8 percentage points higher than the Central Division's rate of return of 12%.

The Southern Division's profit margin of 10% and investment turnover of 1.5 are lower than those of the Northern Division. The product of these factors results in a return on investment of 15% for the Southern Division, compared to 20% for the Northern Division.

Even though the Southern Division's profit margin is lower than the Central Division's, its higher turnover of 1.5 results in a rate of return of 15%, which is greater than the Central Division's rate of return of 12%.

To increase the rate of return on investment, the profit margin and investment turnover for a division may be analyzed. For example, assume that the Northern Division is in a highly competitive industry in which the profit margin cannot be easily increased. As a result, the division manager might focus on increasing the investment turnover.

To illustrate, assume that the revenues of the Northern Division could be increased by \$56,000 through increasing operating expenses, such as advertising, to \$385,000. The Northern Division's income from operations will increase from \$70,000 to \$77,000, computed as follows:

Revenues (\$560,000 + \$56,000)	\$616,000
Operating expenses	385,000
Income from operations before service department charges	\$231,000
Service department charges	154,000
Income from operations	\$ 77,000

The rate of return on investment for the Northern Division, using the DuPont formula, is recomputed as follows:

Rate of Return on Investment = 
$$\frac{\$77,000}{\$616,000} \times \frac{\$616,000}{\$350,000} = 12.5\% \times 1.76 = 22\%$$

Although the Northern Division's profit margin remains the same (12.5%), the investment turnover has increased from 1.6 to 1.76, an increase of 10%  $(0.16 \div 1.6)$ . The 10% increase in investment turnover increases the rate of return on investment by 10% (from 20% to 22%).

The rate of return on investment is also useful in deciding where to invest additional assets or expand operations. For example, DataLink should give priority to expanding operations in the Northern Division because it earns the highest rate of return on investment. In other words, an investment in the Northern Division will return 20 cents (20%) on each dollar invested. In contrast, investments in the Central and Southern divisions will earn only 12 cents and 15 cents, respectively, per dollar invested.

A disadvantage of the rate of return on investment as a performance measure is that it may lead divisional managers to reject new investments that could be profitable for the company as a whole. To illustrate, assume the following rates of return for the Northern Division of DataLink:

Current rate of return on investment	20%
Minimum acceptable rate of return	
on investment set by top management	10%
Expected rate of return	
on investment for new project	14%

If the manager of the Northern Division invests in the new project, the Northern Division's overall rate of return will decrease from 20% due to averaging. Thus, the division manager might decide to reject the project, even though the new project's expected rate of return of 14% exceeds DataLink's minimum acceptable rate of return of 10%.

## Example Exercise 23-4 Profit Margin, Investment Turnover, and ROI



Campbell Company has income from operations of \$35,000, invested assets of \$140,000, and sales of \$437,500. Use the DuPont formula to compute the rate of return on investment and show (a) the profit margin, (b) the investment turnover, and (c) the rate of return on investment.

#### Follow My Example 23-4

- a. Profit Margin =  $$35,000 \div $437,500 = 8\%$
- b. Investment Turnover =  $$437,500 \div $140,000 = 3.125$
- c. Rate of Return on Investment =  $8\% \times 3.125 = 25\%$

Practice Exercises: PE 23-4A, PE 23-4B

### **Residual Income**

Residual income is useful in overcoming some of the disadvantages of the rate of return on investment. **Residual income** is the excess of income from operations over a minimum acceptable income from operations, as shown in Exhibit 7.

Income from operations \$XXX

Less minimum acceptable income from operations as a percent of invested assets \$\frac{XXX}{\\$XXX}\$

Residual income \$\frac{XXX}{\\$XXX}\$

**EXHIBIT 7** 

**Residual Income** 

The minimum acceptable income from operations is computed by multiplying the company minimum rate of return by the invested assets. The minimum rate is set by top management, based on such factors as the cost of financing.

To illustrate, assume that DataLink Inc. has established 10% as the minimum acceptable rate of return on divisional assets. The residual incomes for the three divisions are shown in Exhibit 8.

	Northern Division	Central Division	Southern Division
Income from operations	\$70,000	\$84,000	\$75,000
Less minimum acceptable income			
from operations as a			
percent of invested assets:			
\$350,000 × 10%	35,000		
\$700,000 × 10%		70,000	
\$500,000 × 10%			50,000
Residual income	\$35,000	\$14,000	\$25,000

**EXHIBIT 8** 

Residual Income— DataLink, Inc.

As shown in Exhibit 8, the Northern Division has more residual income (\$35,000) than the other divisions, even though it has the least amount of income from operations (\$70,000). This is because the invested assets are less for the Northern Division than for the other divisions.

The major advantage of residual income as a performance measure is that it considers both the minimum acceptable rate of return, invested assets, and the income from operations for each division. In doing so, residual income encourages division managers to maximize income from operations in excess of the minimum. This provides an incentive to accept any project that is expected to have a rate of return in excess of the minimum.

To illustrate, assume the following rates of return for the Northern Division of DataLink:

Current rate of return on investment	
Minimum acceptable rate of return on investment	
set by top management	10%
Expected rate of return on investment for new project	14%

If the manager of the Northern Division is evaluated on new projects using only return on investment, the division manager might decide to reject the new project. This is because investing in the new project will decrease Northern's current rate of return of 20%. While this helps the division maintain its high ROI, it hurts the company as a whole because the expected rate of return of 14% exceeds DataLink's minimum acceptable rate of return of 10%.

In contrast, if the manager of the Northern Division is evaluated using residual income, the new project would probably be accepted because it will increase the Northern Division's residual income. In this way, residual income supports both divisional and overall company objectives.

## Example Exercise 23-5 Residual Income



The Wholesale Division of PeanutCo has income from operations of \$87,000 and assets of \$240,000. The minimum acceptable rate of return on assets is 12%. What is the residual income for the division?

## Follow My Example 23-5

Income from operations\$87,000Minimum acceptable income from operations as a percent of assets (\$240,000  $\times$  12%)28,800Residual income\$58,200

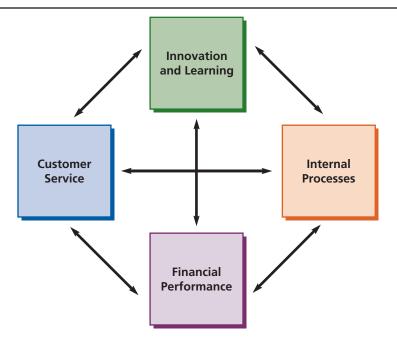
Practice Exercises: PE 23-5A, PE 23-5B

## The Balanced Scorecard²

The **balanced scorecard** is a set of multiple performance measures for a company. In addition to financial performance, a balanced scorecard normally includes performance measures for customer service, innovation and learning, and internal processes, as shown in Exhibit 9.

### **EXHIBIT 9**

The Balanced Scorecard



Performance measures for learning and innovation often revolve around a company's research and development efforts. For example, the number of new products developed during a year and the time it takes to bring new products to the market are performance measures for innovation. Performance measures for learning could include the number of employee training sessions and the number of employees who are cross-trained in several skills.

Performance measures for customer service include the number of customer complaints and the number of repeat customers. Customer surveys can also be used to gather measures of customer satisfaction with the company as compared to competitors.

Performance measures for internal processes include the length of time it takes to manufacture a product. The amount of scrap and waste is a measure of the efficiency

² The balanced scorecard was developed by R. S. Kaplan and D. P. Norton and explained in *The Balanced Scorecard: Translating Strategy into Action* (Cambridge: Harvard Business School Press, 1996).

of a company's manufacturing processes. The number of customer returns is a performance measure of both the manufacturing and sales ordering processes.

All companies will use financial performance measures. Some financial performance measures have been discussed earlier in this chapter and include income from operations, rate of return on investment, and residual income.

The balanced scorecard attempts to identify the underlying nonfinancial drivers, or causes, of financial performance related to innovation and learning, customer service, and internal processes. In this way, the financial performance may be improved. For example, customer satisfaction is often measured by the number of repeat customers. By increasing the number of repeat customers, sales and income from operations can be increased.

Some common performance measures used in the balanced scorecard approach are shown in Exhibit 10.



**Hilton Hotels** Corporation uses a balanced

scorecard to measure employee satisfaction, customer loyalty, and financial performance.

#### **Innovation and Learning**

- Number of new products
- Number of new patents
- Number of cross-trained employees
- Number of training hours
- Number of ethics violations
- Employee turnover

#### **Customer Service**

- Number of repeat customers
- Customer brand recognition
- Delivery time to customer
- Customer satisfaction
- Number of sales returns
- **Customer complaints**

#### **Internal Processes**

- Waste and scrap
- Time to manufacture products
- Number of defects
- Number of rejected sales orders
- Number of stockouts
- · Labor utilization

#### **Financial**

- Sales
- Income from operations
- Return on investment
- Profit margin and investment turnover
- Residual income
- Actual versus budgeted (standard) costs

#### **EXHIBIT 10**

**Balanced Scorecard Performance** Measures

# Service Focus



### **TURNING AROUND CHARLES SCHWAB**

Customer service is a key component to any balanced scorecard, and it is a particularly critical component in service industries. Since 2003, Bain & Company consulting has helped companies improve customer service by focusing on a customer loyalty metric called the Net Promoter Score. This metric, when used as part of a balanced scorecard, evaluates customer service by assessing how likely a customer is to recommend the company to others.

The Charles Schwab Corporation is a full-service financial advisory firm that was founded in 1973. In 2004, the company was struggling. Although Schwab had been built on delivering exceptional customer service, the company had lost its way. When customers were surveyed, they gave Schwab a negative 35% Net Promoter Score, indicating that more customers wanted to see the company fail than would be willing to promote the company to others.

In response, Schwab enlisted Bain to help them improve the customer experience and customer loyalty. Bain helped Schwab develop and implement a Client Promoter System that focused on embedding the Client Promoter Score deep within the company's values and core strategy. As Schwab CEO Walt Bettinger describes, "If you serve clients in the way that you would like to be served, they are going to want to do more business with you." The results were significant. By 2008, the company's stock price had more than doubled, and in 2010, Schwab received a Net Promoter Score of 46%, the highest in its sector.

Source: "Schwab Earns Highest Customer Loyalty Ranking Among Brokerage & Investment Firms in Satmetrix Net Promoter's 2010 Industry Report," Business Wire, March 25, 2010. "Seeing the world through the client's eyes," Bain & Co., http://www.netpromotersystem.com/videos/trailblazer-video/charles-schwab.aspx



Describe and illustrate how

the market price, negotiated price, and cost price approaches to transfer pricing may be used by decentralized segments of a business.

## **Transfer Pricing**

When divisions transfer products or render services to each other, a **transfer price** is used to charge for the products or services.³ Because transfer prices will affect a division's financial performance, setting a transfer price is a sensitive matter for the managers of both the selling and buying divisions.

Three common approaches to setting transfer prices are as follows:

- Market price approach
- Negotiated price approach
- Cost approach

Transfer prices may be used for cost, profit, or investment centers. The objective of setting a transfer price is to motivate managers to behave in a manner that will increase the overall company income. As will be illustrated, however, transfer prices may be misused in such a way that overall company income suffers.

Transfer prices can be set as low as the variable cost per unit or as high as the market price. Often, transfer prices are negotiated at some point between variable cost per unit and market price. Exhibit 11 shows the possible range of transfer prices.

## EXHIBIT 11

Commonly Used Transfer Prices



To illustrate, Wilson Company, a packaged snack food company with no service departments, is used. Wilson has two operating divisions (Eastern and Western) that are organized as investment centers. Condensed income statements for Wilson, assuming no transfers between divisions, are shown in Exhibit 12.

### EXHIBIT 12

Income Statements— No Transfers Between Divisions

Wilson Company Income Statements For the Year Ended December 31, 2016				
	Eastern	Western	Total	
	Division	Division	Company	
Sales:				
50,000 units × \$20 per unit	\$1,000,000		\$1,000,000	
20,000 units × \$40 per unit		\$800,000	800,000	
			\$1,800,000	
Expenses:				
Variable:				
50,000 units × \$10 per unit	\$ 500,000		\$ 500,000	
20,000 units × \$30* per unit		\$600,000	600,000	
Fixed	300,000	100,000	400,000	
Total expenses	\$ 800,000	\$700,000	\$1,500,000	
Income from operations	\$ 200,000	\$100,000	\$ 300,000	
*\$20 of the \$30 per unit represents materials costs, and the remaining \$10 per unit represents other variable conversion expenses incurred within the Western Division.				

³ The discussion in this chapter highlights the essential concepts of transfer pricing. In-depth discussion of transfer pricing can be found in advanced texts

## **Market Price Approach**

Using the **market price approach**, the transfer price is the price at which the product or service transferred could be sold to outside buyers. If an outside market exists for the product or service transferred, the current market price may be a proper transfer price.

Transfer Price = Market Price

To illustrate, assume that materials used by Wilson in producing snack food in the Western Division are currently purchased from an outside supplier at \$20 per unit. The same materials are produced by the Eastern Division. The Eastern Division is operating at full capacity of 50,000 units and can sell all it produces to either the Western Division or to outside buyers.

A transfer price of \$20 per unit (the market price) has no effect on the Eastern Division's income or total company income. The Eastern Division will earn revenues of \$20 per unit on all its production and sales, regardless of who buys its product.

Likewise, the Western Division will pay \$20 per unit for materials (the market price). Thus, the use of the market price as the transfer price has no effect on the Eastern Division's income or total company income.

In this situation, the use of the market price as the transfer price is proper. The condensed divisional income statements for Wilson would be the same as shown in Exhibit 12.

## **Negotiated Price Approach**

If unused or excess capacity exists in the supplying division (the Eastern Division), and the transfer price is equal to the market price, total company profit may not be maximized. This is because the manager of the Western Division will be indifferent toward purchasing materials from the Eastern Division or from outside suppliers. That is, in both cases the Western Division manager pays \$20 per unit (the market price). As a result, the Western Division may purchase the materials from outside suppliers.

If, however, the Western Division purchases the materials from the Eastern Division, the difference between the market price of \$20 and the variable costs of the Eastern Division of \$10 per unit (from Exhibit 12) can cover fixed costs and contribute to overall company profits. Thus, the Western Division manager should be encouraged to purchase the materials from the Eastern Division.

The **negotiated price approach** allows the managers to agree (negotiate) among themselves on a transfer price. The only constraint is that the transfer price be less than the market price but greater than the supplying division's variable costs per unit, as follows:

Variable Costs per Unit < Transfer Price < Market Price

To illustrate, assume that instead of a capacity of 50,000 units, the Eastern Division's capacity is 70,000 units. In addition, assume that the Eastern Division can continue to sell only 50,000 units to outside buyers.

A transfer price less than \$20 would encourage the manager of the Western Division to purchase from the Eastern Division. This is because the Western Division is currently purchasing its materials from outside suppliers at a cost of \$20 per unit. Thus, its materials cost would decrease, and its income from operations would increase.

At the same time, a transfer price above the Eastern Division's variable costs per unit of \$10 would encourage the manager of the Eastern Division to supply materials to the Western Division. In doing so, the Eastern Division's income from operations would also increase.

Exhibit 13 illustrates the divisional and company income statements, assuming that the Eastern and Western division managers agree to a transfer price of \$15.

The Eastern Division increases its sales by \$300,000 (20,000 units  $\times$  \$15 per unit) to \$1,300,000. As a result, the Eastern Division's income from operations increases by \$100,000 (\$300,000 sales – \$200,000 variable costs) to \$300,000, as shown in Exhibit 13.

#### **EXHIBIT 13**

Income Statements— Negotiated Transfer Price



#### Wilson Company **Income Statements** For the Year Ended December 31, 2016 **Eastern** Western **Total** Division Division Company Sales: \$1,000,000 \$1,000,000 300,000 300,000 \$800,000 800,000 \$1,300,000 \$800,000 \$2,100,000 Expenses: Variable: 70,000 units × \$10 per unit..... \$ 700,000 \$ 700,000 20,000 units × \$25* per unit...... \$500,000 500,000 300,000 100,000 400,000 \$600,000 \$1,600,000 Total expenses ..... \$1,000,000 300,000 \$200,000 \$ 500,000 Income from operations..... *\$10 of the \$25 represents variable conversion expenses incurred solely within the Western Division, and \$15 per unit represents the transfer price per unit from the Eastern Division.

The increase of \$100,000 in the Eastern Division's income can also be computed as follows:

Increase in Eastern (Supplying)
Division's Income from Operations

= (Transfer Price - Variable Cost per Unit) × Units Transferred

 $= (\$15 - \$10) \times 20,000 \text{ units} = \$100,000$ 

The Western Division's materials cost decreases by \$5 per unit (\$20 - \$15) for a total of \$100,000 (20,000 units × \$5 per unit). Thus, the Western Division's income from operations increases by \$100,000 to \$200,000, as shown in Exhibit 13.

The increase of \$100,000 in the Western Division's income can also be computed as follows:

Increase in Western (Purchasing)
Division's Income from Operations

= (Market Price – Transfer Price) × Units Transferred

 $= (\$20 - \$15) \times 20,000 \text{ units} = \$100,000$ 

Comparing Exhibits 12 and 13 shows that Wilson's income from operations increased by \$200,000, computed as follows:

	Income from Operations		
	No Units Transferred (Exhibit 12)	20,000 Units Transferred at \$15 per Unit (Exhibit 13)	Increase (Decrease)
Eastern Division Western Division Wilson Company	\$200,000 100,000 \$300,000	\$300,000 200,000 \$500,000	\$100,000 100,000 \$200,000

In the preceding illustration, any negotiated transfer price between \$10 and \$20 is acceptable, as shown in the following formula:

Variable Costs per Unit < Transfer Price < Market Price \$10 < Transfer Price < \$20 Any transfer price within this range will increase the overall income from operations for Wilson by \$200,000. However, the increases in the Eastern and Western divisions' income from operations will vary depending on the transfer price.

To illustrate, a transfer price of \$16 would increase the Eastern Division's income from operations by \$120,000, computed as follows:

```
Increase in Eastern (Supplying)
Division's Income from Operations = (\text{Transfer Price} - \text{Variable Cost per Unit}) \times \text{Units Transferred}
= (\$16 - \$10) \times 20,000 \text{ units} = \$120,000
```

A transfer price of \$16 would increase the Western Division's income from operations by \$80,000, computed as follows:

```
Increase in Western (Purchasing)
Division's Income from Operations = (Market \ Price - Transfer \ Price) \times Units \ Transferred
= (\$20 - \$16) \times 20,000 \ units = \$80,000
```

With a transfer price of \$16, Wilson Company's income from operations still increases by \$200,000, which consists of the Eastern Division's increase of \$120,000 plus the Western Division's increase of \$80,000.

As shown, a negotiated price provides each division manager with an incentive to negotiate the transfer of materials. At the same time, the overall company's income from operations will also increase. However, the negotiated approach only applies when the supplying division has excess capacity. In other words, the supplying division cannot sell all its production to outside buyers at the market price.

## **Example Exercise 23-6** Transfer Pricing



The materials used by the Winston-Salem Division of Fox Company are currently purchased from outside suppliers at \$30 per unit. These same materials are produced by Fox's Flagstaff Division. The Flagstaff Division can produce the materials needed by the Winston-Salem Division at a variable cost of \$15 per unit. The division is currently producing 70,000 units and has capacity of 100,000 units. The two divisions have recently negotiated a transfer price of \$22 per unit for 30,000 units. By how much will each division's income increase as a result of this transfer?

## Follow My Example 23-6

```
Increase in Flagstaff (Supplying)
Division's Income from Operations = (\$22 - \$15) \times 30,000 \text{ units} = \$210,000
Increase in Winston-Salem (Purchasing)
Division's Income from Operations = (\$30 - \$22) \times 30,000 \text{ units} = \$240,000
```

Practice Exercises: PE 23-6A, PE 23-6B

## **Cost Price Approach**

Under the **cost price approach**, cost is used to set transfer prices. A variety of costs may be used in this approach, including the following:

- Total product cost per unit
- Variable product cost per unit

If total product cost per unit is used, direct materials, direct labor, and factory overhead are included in the transfer price. If variable product cost per unit is used, the fixed factory overhead cost is excluded from the transfer price.

Actual costs or standard (budgeted) costs may be used in applying the cost price approach. If actual costs are used, inefficiencies of the producing (supplying) division

are transferred to the purchasing division. Thus, there is little incentive for the producing (supplying) division to control costs. For this reason, most companies use standard costs in the cost price approach. In this way, differences between actual and standard costs remain with the producing (supplying) division for cost control purposes.

The cost price approach is most often used when the responsibility centers are organized as cost centers. When the responsibility centers are organized as profit or investment centers, the cost price approach is normally not used.

For example, using the cost price approach when the supplying division is organized as a profit center ignores the supplying division manager's responsibility for earning profits. In this case, using the cost price approach prevents the supplying division from reporting any profit (revenues – costs) on the units transferred. As a result, the division manager has little incentive to transfer units to another division, even though it may be in the best interests of the company.

## Integrity, Objectivity, and Ethics in Business



#### THE ETHICS OF TRANSFER PRICES

Transfer prices allow large multinational companies to minimize taxes by shifting taxable income from countries with high tax rates to countries with low taxes. For example, a British company will pay U.S. taxes on income from its U.S. division, and British taxes on income from its British division. Because this company can set its own transfer price, it can minimize its overall tax bill by setting a high transfer price when transferring goods to the United States This increases cost of goods sold for

the highly taxed U.S division and increases sales for the lesser taxed British division. The overall result is a lower tax bill for the multinational company as a whole. In recent years, government tax authorities like the Internal Revenue Service (IRS) have become concerned with tax avoidance through transfer price manipulation. In response, many countries now have guidelines for setting transfer prices that assure that transfer prices are not subject to manipulation for tax purposes.

 $Source: L.\ Eden, and\ L.\ M.\ Smith,\ "The\ Ethics\ of\ Transfer\ Pricing,"\ unpublished\ working\ paper,\ Texas\ A\&M\ University,\ 2011.$ 

# At a Glance 23



#### Describe the advantages and disadvantages of decentralized operations.

**Key Points** In a centralized business, all major planning and operating decisions are made by top management. In a decentralized business, these responsibilities are delegated to unit managers. Decentralization may be more effective because operational decisions are made by the managers closest to the operations.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the advantages of decentralization.</li> </ul>		
• Describe the disadvantages of decentralization.		
<ul> <li>Describe the common types of responsibility centers and the role of responsibility accounting.</li> </ul>		



#### Prepare a responsibility accounting report for a cost center.

**Key Points** Cost centers limit the responsibility and authority of managers to decisions related to the costs of their unit. The primary tools for planning and controlling are budgets and budget performance reports.

Learning Outcomes	Example Exercises	Practice Exercises	
• Describe cost centers.			
• Describe the responsibility reporting for a cost center.			
• Compute the costs over (under) budget for a cost center.	EE23-1	PE23-1A, 23-1B	



#### Prepare responsibility accounting reports for a profit center.

**Key Points** In a profit center, managers have the responsibility and authority to make decisions that affect both revenues and costs. Responsibility reports for a profit center usually show income from operations for the unit.

Learning Outcomes	Example Exercises	Practice Exercises
Describe profit centers.		
• Determine how service department charges are allocated to profit centers.	EE23-2	PE23-2A, 23-2B
• Describe the responsibility reporting for a profit center.		
• Compute income from operations for a profit center.	EE23-3	PE23-3A, 23-3B



Compute and interpret the rate of return on investment, the residual income, and the balanced scorecard for an investment center.

**Key Points** In an investment center, the unit manager has the responsibility and authority to make decisions that affect the unit's revenues, expenses, and assets invested in the center. Three measures are commonly used to assess investment center performance: return on investment (ROI), residual income, and the balanced scorecard. These measures are often used to compare investment center performance.

Learning Outcomes	Example Exercises	Practice Exercises
Describe investment centers.		
• Describe the responsibility reporting for an investment center.		
• Compute the profit margin, investment turnover, and rate of return on investment (ROI).	EE23-4	PE23-4A, 23-4B
Compute residual income.	EE23-5	PE23-5A, 23-5B
Describe the balanced scorecard approach.		



Describe and illustrate how the market price, negotiated price, and cost price approaches to transfer pricing may be used by decentralized segments of a business.

**Key Points** When divisions within a company transfer products or provide services to each other, a transfer price is used to charge for the products or services. Transfer prices should be set so that the overall company income is increased when goods are transferred between divisions. One of three approaches is typically used to establish transfer prices: market price, negotiated price, or cost price.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe how companies determine the price used to transfer products or services between divisions.</li> </ul>		
• Determine transfer prices using the market price approach.		
• Determine transfer prices using the negotiated price approach.	EE23-6	PE23-6A, 23-6B
• Describe the cost price approach to determining transfer price.		

## **Key Terms**

balanced scorecard (1088) controllable expenses (1080) controllable revenues (1080) cost center (1078) cost price approach (1093) DuPont formula (1084) investment center (1083) investment turnover (1084) market price approach (1091) negotiated price approach (1091) profit center (1080) profit margin (1084) rate of return on investment (ROI) (1084) residual income (1087) responsibility accounting (1077) service department charges (1080) transfer price (1090)

## **Illustrative Problem**

Quinn Company has two divisions, Domestic and International. Invested assets and condensed income statement data for each division for the year ended December 31, 2016, are as follows:

	Domestic Division	International Division
Revenues	\$675,000	\$480,000
Operating expenses	450,000	372,400
Service department charges	90,000	50,000
Invested assets	600,000	384,000

#### **Instructions**

- 1. Prepare condensed income statements for the past year for each division.
- 2. Using the DuPont formula, determine the profit margin, investment turnover, and rate of return on investment for each division.
- 3. If management's minimum acceptable rate of return is 10%, determine the residual income for each division.

#### Solution

1.

# Quinn Company Divisional Income Statements For the Year Ended December 31, 2016

	<b>Domestic Division</b>	International Division
Revenues	\$675,000	\$480,000
Operating expenses	450,000	372,400
Income from operations before		
service department charges	\$225,000	\$107,600
Service department charges	90,000	50,000
Income from operations	\$135,000	\$ 57,600

2. Rate of Return on Investment = Profit Margin  $\times$  Investment Turnover

Rate of Return on Investment = 
$$\frac{\text{Income from Operations}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Invested Assets}}$$

$$\text{Domestic Division: ROI} = \frac{\$135,000}{\$675,000} \times \frac{\$675,000}{\$600,000}$$

$$= 20\% \times 1.125$$

$$= 22.5\%$$

$$\text{International Division: ROI} = \frac{\$57,600}{\$480,000} \times \frac{\$480,000}{\$384,000}$$

$$= 12\% \times 1.25$$

$$= 15\%$$

3. Domestic Division: \$75,000 [\$135,000 – (10% × \$600,000)] International Division: \$19,200 [\$57,600 – (10% × \$384,000)]

# **Discussion Questions**

- 1. Differentiate between centralized and decentralized operations.
- 2. Differentiate between a profit center and an investment center.
- 3. Weyerhaeuser developed a system that assigns service department expenses to user divisions on the basis of actual services consumed by the division. Here are a number of Weyerhaeuser's activities in its central Financial Services Department:
  - Payroll
  - · Accounts payable
  - · Accounts receivable
  - Database administration—report preparation For each activity, identify an activity base that could be used to charge user divisions for service.
- 4. What is the major shortcoming of using income from operations as a performance measure for investment centers?

- 5. In a decentralized company in which the divisions are organized as investment centers, how could a division be considered the least profitable even though it earned the largest amount of income from operations?
- 6. How does using the rate of return on investment facilitate comparability between divisions of decentralized companies?
- 7. Why would a firm use a balanced scorecard in evaluating divisional performance?
- 8. What is the objective of transfer pricing?
- 9. When is the negotiated price approach preferred over the market price approach in setting transfer prices?
- 10. When using the negotiated price approach to transfer pricing, within what range should the transfer price be established?

## **Practice Exercises**



**EE 23-1** *p. 1079* 

#### PE 23-1A Budgetary performance for cost center

OBJ. 2

Caroline Company's costs were over budget by \$319,000. The company is divided into West and East regions. The East Region's costs were under budget by \$47,500. Determine the amount that the West Region's costs were over or under budget.



**EE 23-1** *p. 1079* 

#### PE 23-1B Budgetary performance for cost center

OBJ. 2

Conley Company's costs were under budget by \$198,000. The company is divided into North and South regions. The North Region's costs were over budget by \$52,000. Determine the amount that the South Region's costs were over or under budget.



**EE 23-2** *p. 1082* 

#### PE 23-2A Service department charges

OBJ. 3

The centralized employee travel department of Camtro Company has expenses of \$528,000. The department has serviced a total of 6,000 travel reservations for the period. The Southeast Division has made 2,400 reservations during the period, and the Pacific Northwest Division has made 3,600 reservations. How much should each division be charged for travel services?



**EE 23-2** *p. 1082* 

#### PE 23-2B Service department charges

OBJ. 3

The centralized computer technology department of Lee Company has expenses of \$264,000. The department has provided a total of 2,500 hours of service for the period. The Retail Division has used 1,125 hours of computer technology service during the period, and the Commercial Division has used 1,375 hours of computer technology service. How much should each division be charged for computer technology department services?



#### PE 23-3A Income from operations for profit center

OBJ. 3

Using the data for Camtro Company from Practice Exercise 23-2A along with the following data, determine the divisional income from operations for the Northeast and Pacific divisions:



	Northeast Division	Pacific Division
Sales	\$1,155,000	\$1,204,000
Cost of goods sold	590,800	658,000
Selling expenses	231,000	252,000

#### **EE 23-3** p. 1083

#### PE 23-3B Income from operations for profit center

OBJ. 3

Using the data for Lee Company from Practice Exercise 23-2B along with the following data, determine the divisional income from operations for the Division and the Commercial Division:



	Retail Division	Commercial Division
Sales	\$945,000	\$966,000
Cost of goods sold	504,000	559,300
Selling expenses	156,800	175,000

#### **EE 23-4** *p.* 1086

#### PE 23-4A Profit margin, investment turnover, and ROI

**OBJ. 4** 



Cash Company has income from operations of \$112,500, invested assets of \$750,000, and sales of \$1,875,000. Use the DuPont formula to compute the rate of return on investment and show (a) the profit margin, (b) the investment turnover, and (c) the rate of return on investment.

#### **EE 23-4** p. 1086

### PE 23-4B Profit margin, investment turnover, and ROI

OBJ. 4



Briggs Company has income from operations of \$36,000, invested assets of \$180,000, and sales of \$720,000. Use the DuPont formula to compute the rate of return on investment and show (a) the profit margin, (b) the investment turnover, and (c) the rate of return on investment.

#### **EE 23-5** *p. 1088*

#### PE 23-5A Residual income

OBJ. 4



The Consumer Division of Hernandez Company has income from operations of \$90,000 and assets of \$450,000. The minimum acceptable rate of return on assets is 10%. What is the residual income for the division?

#### **EE 23-5** p. 1088

#### PE 23-5B Residual income

**OBJ. 4** 



The Commercial Division of Herring Company has income from operations of \$420,000 and assets of \$910,000. The minimum acceptable rate of return on assets is 8%. What is the residual income for the division?

#### **EE 23-6** p. 1093

#### PE 23-6A Transfer pricing

OBJ. 5



The materials used by the North Division of Horton Company are currently purchased from outside suppliers at \$60 per unit. These same materials are produced by Horton's South Division. The South Division can produce the materials needed by the North Division at a variable cost of \$42 per unit. The division is currently producing 200,000 units and has capacity of 250,000 units. The two divisions have recently negotiated a transfer price of \$52 per unit for 30,000 units. By how much will each division's income increase as a result of this transfer?

#### **EE 23-6** *p. 1093*

#### PE 23-6B Transfer pricing

OBJ. 5



The materials used by the Multinomah Division of Isbister Company are currently purchased from outside suppliers at \$90 per unit. These same materials are produced by the Pembroke Division. The Pembroke Division can produce the materials needed by the Multinomah Division at a variable cost of \$75 per unit. The division is currently producing 120,000 units and has capacity of 150,000 units. The two divisions have recently negotiated a transfer price of \$82 per unit for 15,000 units. By how much will each division's income increase as a result of this transfer?

### Exercises

#### EX 23-1 Budget performance reports for cost centers

OBJ. 2

✓ a. (c) \$3,540

Partially completed budget performance reports for Saskatoon Company, a manufacturer of light duty motors, follow:



#### Saskatoon Company Budget Performance Report—Vice President, Production For the Month Ended June 30, 2016

Plant	Budget	Actual	Over Budget	Under Budget
Eastern Region	\$936,000	\$933,750		\$2,250
Central Region	669,600	666,000		3,600
Western Region	(g)	(h)	(i)	
	(j)	(k)	\$ (I)	\$5,850

(Continued)

#### Saskatoon Company Budget Performance Report—Manager, Western Region Plant For the Month Ended June 30, 2016

Department	Budget	Actual	Over Budget	Under Budget
Chip Fabrication	(a)	(b)	(c)	
Electronic Assembly	\$191,250	\$194,040	\$ 2,520	
Final Assembly	308,250	307,440		\$810
	(d)	(e)	\$ (f)	\$810

#### Saskatoon Company Budget Performance Report—Supervisor, Chip Fabrication For the Month Ended June 30, 2016

Cost	Budget	Actual	Over Budget	Under Budget
Factory wages	\$ 59,940	\$ 61,500	\$1,560	
Materials	156,600	155,520		\$1,080
Power and light	8,640	10,260	1,620	
Maintenance	15,120	16,560	1,440	
	\$240,300	\$243,840	\$4,620	\$1,080

- a. Complete the budget performance reports by determining the correct amounts for the lettered spaces.
- b. Compose a memo to Robin Mooney, vice president of production for Saskatoon Company, explaining the performance of the production division for May.

#### EX 23-2 Divisional income statements

OBJ. 3

The following data were summarized from the accounting records for Jersey Coast Construction Company for the year ended June 30, 2016:

Cost of goods sold:		Service department charges:	
Commercial Division	\$912,250	Commercial Division	\$112,560
Residential Division	423,675	Residential Division	67,830
Administrative expenses:		Sales:	
Commercial Division	\$149,800	Commercial Division	\$1,354,500
Residential Division	128,625	Residential Division	743,780

Prepare divisional income statements for Jersey Coast Construction Company.

#### EX 23-3 Service department charges and activity bases

OBJ. 3

For each of the following service departments, identify an activity base that could be used for charging the expense to the profit center:

- a. Legal
- b. Duplication services
- c. Electronic data processing
- d. Central purchasing
- e. Telecommunications
- f. Accounts receivable

✓ Commercial Division income from operations, \$179,890

#### EX 23-4 Activity bases for service department charges

OBJ. 3

**✓** c. 2

For each of the following service departments, select the activity base listed that is most appropriate for charging service expenses to responsible units:

Service Department		Act	ivity Base
a.	Accounts Receivable	1.	Number of conference attendees
b.	Central Purchasing	2.	Number of computers
c.	Computer Support	3.	Number of employees trained
d.	Conferences	4.	Number of cell phone minutes used
e.	Employee Travel	5.	Number of purchase requisitions
f.	Payroll Accounting	6.	Number of sales invoices
g.	Telecommunications	7.	Number of payroll checks
h.	Training	8.	Number of travel claims

#### EX 23-5 Service department charges

OBJ. 3

In divisional income statements prepared for LeFevre Company, the Payroll Department costs are charged back to user divisions on the basis of the number of payroll distributions, and the Purchasing Department costs are charged back on the basis of the number of purchase requisitions. The Payroll Department had expenses of \$75,400, and the Purchasing Department had expenses of \$42,000 for the year. The following annual data for Residential, Commercial, and Government Contract divisions were obtained from corporate records:

	Residential	Commercial	<b>Government Contract</b>
Sales	\$1,000,000	\$1,600,000	\$3,200,000
Number of employees:			
Weekly payroll (52 weeks per year)	300	150	200
Monthly payroll	75	160	90
Number of purchase requisitions per year	4,000	3,500	3,000

- a. Determine the total amount of payroll checks and purchase requisitions processed per year by the company and each division.
- b. Using the activity base information in (a), determine the annual amount of payroll and purchasing costs charged back to the Residential, Commercial, and Government Contract divisions from payroll and purchasing services.
- c. Why does the Residential Division have a larger service department charge than the other two divisions, even though its sales are lower?

#### EX 23-6 Service department charges and activity bases

OBJ. 3

Middler Corporation, a manufacturer of electronics and communications systems, uses a service department charge system to charge profit centers with Computing and Communications Services (CCS) service department costs. The following table identifies an abbreviated list of service categories and activity bases used by the CCS department. The table also includes some assumed cost and activity base quantity information for each service for October.

CCS Service Category	Activity Base	Budgeted Cost	Budgeted Activity Base Quantity
Help desk	Number of calls	\$160,000	3,200
Network center	Number of devices monitored	735,000	9,800
Electronic mail	Number of user accounts	100,000	10,000
Smart phone support	Number of smart phones issued	124,600	8,900

One of the profit centers for Middler Corporation is the Communication Systems (COMM) sector. Assume the following information for the COMM sector:

- The sector has 5,200 employees, of whom 25% are office employees.
- All the office employees have been issued a smart phone, and 96% of them have a computer on the network.

(Continued)

SHOW

✓ b. Residential

payroll, \$33,400



✓ b. Help desk, \$93,600

- One hundred percent of the employees with a computer also have an e-mail account.
- The average number of help desk calls for October was 1.5 calls per individual with a computer.
- There are 600 additional printers, servers, and peripherals on the network beyond the personal computers.
- a. Determine the service charge rate for the four CCS service categories for October.
- b. Determine the charges to the COMM sector for the four CCS service categories for October.

#### **EX 23-7** Divisional income statements with service department charges

OBJ. 3

Yozamba Technology has two divisions, Consumer and Commercial, and two corporate service departments, Tech Support and Purchasing. The corporate expenses for the year ended December 31, 2016, are as follows:

Tech Support Department	\$ 516,000
Purchasing Department	89,600
Other corporate administrative expenses	 560,000
Total corporate expense	\$ 1,165,600

The other corporate administrative expenses include officers' salaries and other expenses required by the corporation. The Tech Support Department charges the divisions for services rendered, based on the number of computers in the department, and the Purchasing Department charges divisions for services, based on the number of purchase orders for each department. The usage of service by the two divisions is as follows:

	Tech Support	Purchasing
Consumer Division	375 computers	1,960 purchase orders
Commercial Division	225	_3,640
Total	600 computers	5,600 purchase orders

The service department charges of the Tech Support Department and the Purchasing Department are considered controllable by the divisions. Corporate administrative expenses are not considered controllable by the divisions. The revenues, cost of goods sold, and operating expenses for the two divisions are as follows:

	Consumer	Commercial
Revenues	\$7,430,000	\$6,184,000
Cost of goods sold	4,123,000	3,125,000
Operating expenses	1,465,000	1,546,000

Prepare the divisional income statements for the two divisions.

#### EX 23-8 Corrections to service department charges for a service company

OBJ. 3

Wild Sun Airlines Inc. has two divisions organized as profit centers, the Passenger Division and the Cargo Division. The following divisional income statements were prepared:

# Wild Sun Airlines Inc. Divisional Income Statements For the Year Ended December 31, 2016

	Passeng	ger Division	Cargo	Division
Revenues		\$3,025,000		\$3,025,000
Operating expenses		2,450,000		2,736,000
Income from operations before service department charges		\$ 575,000		\$ 289,000
Less service department charges:				
Training	\$125,000		\$125,000	
Flight scheduling	108,000		108,000	
Reservations	151,200	384,200	151,200	384,200
Income from operations		\$ 190,800		\$ (95,200)

✓ Commercial income from operations, \$1,261,260





✓ b. Income from operations, Cargo Division, \$84,400



The service department charge rate for the service department costs was based on revenues. Because the revenues of the two divisions were the same, the service department charges to each division were also the same.

The following additional information is available:

	Passenger Division	Cargo Division	Total
Number of personnel trained	350	150	500
Number of flights	800	1,200	2,000
Number of reservations requested	20,000	0	20,000

- a. Does the income from operations for the two divisions accurately measure performance? Explain.
- b. Correct the divisional income statements, using the activity bases provided in revising the service department charges.

#### EX 23-9 Profit center responsibility reporting

OBJ. 3

XSport Sporting Goods Co. operates two divisions—the Winter Sports Division and the Summer Sports Division. The following income and expense accounts were provided from the trial balance as of December 31, 2016, the end of the fiscal year, after all adjustments, including those for inventories, were recorded and posted:

Sales—Winter Sports Division	\$10,500,000
Sales—Summer Sports Division	13,600,000
Cost of Goods Sold—Winter Sports Division	6,300,000
Cost of Goods Sold—Summer Sports Division	7,888,000
Sales Expense—Winter Sports Division	1,680,000
Sales Expense—Summer Sports Division	1,904,000
Administrative Expense—Winter Sports Division	1,050,000
Administrative Expense—Summer Sports Division	1,210,400
Advertising Expense	482,000
Transportation Expense	240,000
Accounts Receivable Collection Expense	120,500
Warehouse Expense	1,200,000

The bases to be used in allocating expenses, together with other essential information, are as follows:

- a. Advertising expense—incurred at headquarters, charged back to divisions on the basis of usage: Winter Sports Division, \$216,900; Summer Sports Division, \$265,100.
- b. Transportation expense—charged back to divisions at a charge rate of \$8.00 per bill of lading: Winter Sports Division, 14,400 bills of lading; Summer Sports Division, 15,600 bills of lading.
- c. Accounts receivable collection expense—incurred at headquarters, charged back to divisions at a charge rate of \$5.00 per invoice: Winter Sports Division, 9,640 sales invoices; Summer Sports Division, 14,460 sales invoices.
- d. Warehouse expense—charged back to divisions on the basis of floor space used in storing division products: Winter Sports Division, 94,000 square feet; Summer Sports Division, 106,000 square feet.

Prepare a divisional income statement with two column headings: Winter Sports Division and Summer Sports Division. Provide supporting calculations for service department charges.

✓ Income from operations, Summer Sports Division, \$1,499,400





#### **EX 23-10** Rate of return on investment

**OBJ. 4** 

✓ a. Retail, 26%

✓ a. Retail Division,

\$211,200

ME HOW

✓ d. 3.00



The income from operations and the amount of invested assets in each division of Magentic Zero Industries are as follows:

	Income from Operations	Invested Assets
Retail Division	\$343,200	\$1,320,000
Commercial Division	320,000	1,600,000
Internet Division	176,000	800,000

- a. Compute the rate of return on investment for each division.
- b. Which division is the most profitable per dollar invested?

#### EX 23-11 Residual income

OBJ. 4

Based on the data in Exercise 23-10, assume that management has established a 10% minimum acceptable rate of return for invested assets.

- a. Determine the residual income for each division.
- b. Which division has the most residual income?

#### **EX 23-12** Determining missing items in rate of return computation

**OBJ. 4** 

OBJ. 4

One item is omitted from each of the following computations of the rate of return on investment:

Rate of Return on Investment	= P	rofit Margin	×	Investment Turnover
13.2%	=	6%	×	(a)
(b)	=	10%	×	1.80
10.5%	=	(c)	×	1.50
15%	=	5%	×	(d)
(e)	=	12%	×	1.10

Determine the missing items, identifying each by the appropriate letter.

## ✓ a. ROI, 28%



#### EX 23-13 Profit margin, investment turnover, and rate of return on investment

The condensed income statement for the Consumer Products Division of Bantastic Industries Inc. is as follows (assuming no service department charges):

Sales	\$16,000,000
Cost of goods sold	11,660,000
Gross profit	\$4,340,000
Administrative expenses	2,100,000
Income from operations	\$ 2,240,000

The manager of the Consumer Products Division is considering ways to increase the rate of return on investment.

- a. Using the DuPont formula for rate of return on investment, determine the profit margin, investment turnover, and rate of return on investment of the Consumer Products Division, assuming that \$8,000,000 of assets have been invested in the Consumer Products Division.
- b. If expenses could be reduced by \$320,000 without decreasing sales, what would be the impact on the profit margin, investment turnover, and rate of return on investment for the Consumer Products Division?

#### EX 23-14 Rate of return on investment

OBJ. 4

The Walt Disney Company has four profitable business segments, described as follows:

- Media Networks: The ABC television and radio network, Disney channel, ESPN, A&E, E!, and Disney.com
- Parks and Resorts: Walt Disney World Resort, Disneyland, Disney Cruise Line, and other resort properties

✓ a. Media Networks ROI, 23.8%



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- Studio Entertainment: Walt Disney Pictures, Touchstone Pictures, Hollywood Pictures, Miramax Films, and Buena Vista Theatrical Productions
- Consumer Products: Character merchandising, Disney stores, books, and magazines Disney recently reported sector income from operations, revenue, and invested assets (in millions) as follows:

	Income from Operations	Revenue	Invested Assets
Media Networks	\$6,818	\$20,356	\$28,627
Parks and Resorts	2,220	14,087	22,056
Studio Entertainment	661	5,979	14,750
Consumer Products	1,112	3,811	7,506

- a. Use the DuPont formula to determine the rate of return on investment for the four Disney sectors. Round whole percents to one decimal place and investment turnover to two decimal places.
- b. How do the four sectors differ in their profit margin, investment turnover, and return on investment?

#### EX 23-15 Determining missing items in rate of return and residual income computations

**OBJ. 4** 

✓ c. \$46,250

✓ a. (e) \$300,000

Data for Uberto Company are presented in the following table of rates of return on investment and residual incomes:

Invested Assets	Income from Operations	Rate of Return on Investment	Minimum Rate of Return	Minimum Acceptable Income from Operations	Residual Income
\$925,000	\$185,000	(a)	15%	(b)	(c)
\$775,000	(d)	(e)	(f)	\$93,000	\$23,250
\$450,000	(g)	18%	(h)	\$58,500	(i)
\$610,000	\$97,600	(j)	12%	(k)	(I)

Determine the missing items, identifying each item by the appropriate letter.

#### EX 23-16 Determining missing items from computations

OBJ. 4

Data for the North, South, East, and West divisions of Free Bird Company are as follows:

	Sales	Income from Operations	Invested Assets	Rate of Return on Investment	Profit Margin	Investment Turnover
North	\$860,000	(a)	(b)	17.5%	7.0%	(c)
South	(d)	\$51,300	(e)	(f)	4.5%	3.8
East	\$1,020,000	(g)	\$680,000	15.0%	(h)	(i)
West	\$1,120,000	\$89,600	\$560,000	(j)	(k)	(I)

- a. Determine the missing items, identifying each by the letters (a) through (l). Round percents and investment turnover to one decimal place.
- b. Determine the residual income for each division, assuming that the minimum acceptable rate of return established by management is 12%.
- c. Which division is the most profitable in terms of (1) return on investment and (2) residual income?



#### EX 23-17 Rate of return on investment, residual income for a service company **OBJ. 4** Starwood Hotels & Resorts Worldwide provides lodging services around the world. The

- company is separated into two major divisions. **Hotel Ownership:** Hotels owned and operated by Starwood.
- Vacation Ownership: Resort properties developed, owned, and operated for timeshare vacation owners.

(Continued)

Financial information for each division, from a recent annual report, is as follows (in millions):

	Hotel Ownership	Vacation Ownership
Revenues	\$4,383	\$ 688
Income from operations	571	105
Total assets	6,440	2,139

- a. Use the DuPont formula to determine the return on investment for each of the Starwood business divisions. Round whole percents to one decimal place and investment turnover to two decimal places.
- b. Determine the residual income for each division, assuming a minimum acceptable income of 5% of total assets. Round minimal acceptable return to the nearest million dollars.
- c. Interpret your results.

#### EX 23-18 Balanced scorecard for a service company

OBJ. 4

American Express Company is a major financial services company, noted for its American Express® card. Some of the performance measures used by the company in its balanced scorecard follow:

Average card member spending	Number of Internet features
Cards in force	Number of merchant signings
Earnings growth	Number of new card launches
Hours of credit consultant training	Return on equity
Investment in information technology	Revenue growth
Number of card choices	

For each measure, identify whether the measure best fits the innovation, customer, internal process, or financial dimension of the balanced scorecard.

#### EX 23-19 Building a balanced scorecard

OBJ. 4

Hit-n-Run Inc. owns and operates 10 food trucks (mobile kitchens) throughout metropolitan Los Angeles. Each food truck has a different food theme, such as Irish-Mexican fusion, traditional Mexican street food, Ethiopian cuisine, and Lebanese-Italian fusion. The company was founded three years ago by Juanita O'Brien when she opened a single food truck with a unique menu. As her business has grown, she has become concerned about her ability to manage and control the business. O'Brien describes how the company was built, its key success factors, and its recent growth.

"I built the company from the ground up. In the beginning it was just me. I drove the truck, set the menu, bought the ingredients, prepared the meals, served the meals, cleaned the kitchen, and maintained the equipment. I made unique meals from quality ingredients, and didn't serve anything that wasn't perfect. I changed my location daily, and notified customers of my location via twitter.

As my customer base grew, I hired employees to help me in the truck. Then one day I realized that I had a formula that could be expanded to multiple trucks. Before I knew it, I had 10 trucks and was hiring people to do everything that I used to do by myself. Now, I work with my team to build the menu, set daily locations for the trucks, and manage the operations of the business.

My business model is based on providing the highest quality street food and charging more for it than other trucks. You won't get the cheapest meal at one of my trucks, but you will get the best. The superior quality allows me to price my meals a little bit higher than the other trucks. My employees are critical to my success. I pay them a better wage than they could make on other food trucks, and I expect more from them. I rely on them to maintain the quality that I established when I opened my first truck.

Things are going great, but I'm feeling overwhelmed. So far, the growth in sales has led to a growth in profitability—but I'm getting nervous. If quality starts to fall off, my brand value erodes, and that could affect the prices that I charge for my meals and the success of my business."





Create balanced scorecard measures for Hit-n-Run Food Trucks. Identify whether these measures best fit the innovation, customer, internal process, or financial dimension of the balanced scorecard.

#### EX 23-20 Decision on transfer pricing

OBJ. 5

✓ a. \$3,000,000

Materials used by the Instrument Division of XPort Industries are currently purchased from outside suppliers at a cost of \$210 per unit. However, the same materials are available from the Components Division. The Components Division has unused capacity and can produce the materials needed by the Instrument Division at a variable cost of \$160 per unit.

- a. If a transfer price of \$180 per unit is established and 60,000 units of materials are transferred, with no reduction in the Components Division's current sales, how much would XPort Industries' total income from operations increase?
- b. How much would the Instrument Division's income from operations increase?
- c. How much would the Components Division's income from operations increase?

#### EX 23-21 Decision on transfer pricing

OBJ. 5

**✓** b. \$1,200,000

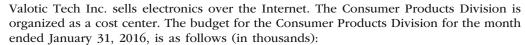
Based on XPort Industries' data in Exercise 23-20, assume that a transfer price of \$190 has been established and that 60,000 units of materials are transferred, with no reduction in the Components Division's current sales.

- a. How much would XPort Industries' total income from operations increase?
- b. How much would the Instrument Division's income from operations increase?
- c. How much would the Components Division's income from operations increase?
- d. If the negotiated price approach is used, what would be the range of acceptable transfer prices and why?

## **Problems: Series A**

#### PR 23-1A Budget performance report for a cost center

OBJ. 2



Customer service salaries	\$ 546,840
Insurance and property taxes	114,660
Distribution salaries	872,340
Marketing salaries	1,028,370
Engineer salaries	836,850
Warehouse wages	586,110
Equipment depreciation	183,792
Total	\$4.168.962

During January, the costs incurred in the Consumer Products Division were as follows:

Customer service salaries	\$ 602,350
Insurance and property taxes	110,240
Distribution salaries	861,200
Marketing salaries	1,085,230
Engineer salaries	820,008
Warehouse wages	562,632
Equipment depreciation	183,610
Total	\$4,225,270

#### **Instructions**

- 1. Prepare a budget performance report for the director of the Consumer Products Division for the month of January.
- 2. For which costs might the director be expected to request supplemental reports?









#### PR 23-2A Profit center responsibility reporting for a service company

OBJ. 3

Traxonia Railroad Inc. has three regional divisions organized as profit centers. The chief executive officer (CEO) evaluates divisional performance, using income from operations as a percent of revenues. The following quarterly income and expense accounts were provided from the trial balance as of December 31, 2016:

Revenues—East	\$ 870,000
Revenues—West	1,032,000
Revenues—Central	1,872,000
Operating Expenses—East	563,300
Operating Expenses—West	618,240
Operating Expenses—Central	1,166,940
Corporate Expenses—Shareholder Relations	154,000
Corporate Expenses—Customer Support	400,000
Corporate Expenses—Legal	270,000
General Corporate Officers' Salaries	275,000

The company operates three service departments: Shareholder Relations, Customer Support, and Legal. The Shareholder Relations Department conducts a variety of services for shareholders of the company. The Customer Support Department is the company's point of contact for new service, complaints, and requests for repair. The department believes that the number of customer contacts is an activity base for this work. The Legal Department provides legal services for division management. The department believes that the number of hours billed is an activity base for this work. The following additional information has been gathered:

	East	West	Central
Number of customer contacts	5,000	6,000	9,000
Number of hours billed	1,350	2,160	1,890

#### **Instructions**

- 1. Prepare quarterly income statements showing income from operations for the three divisions. Use three column headings: East, West, and Central.
- 2. Identify the most successful division according to the profit margin.
- Provide a recommendation to the CEO for a better method for evaluating the performance of the divisions. In your recommendation, identify the major weakness of the present method.

#### PR 23-3A Divisional income statements and rate of return on investment analysis OBJ. 4

The Crunchy Granola Company is a diversified food company that specializes in all natural foods. The company has three operating divisions organized as investment centers. Condensed data taken from the records of the three divisions for the year ended June 30, 2016, are as follows:

	Cereal Division	Snack Cake Division	Retail Bakeries Division
Sales	\$25,000,000	\$8,000,000	\$9,750,000
Cost of goods sold	16,670,000	5,575,000	6,795,000
Operating expenses	7,330,000	1,945,000	2,272,500
Invested assets	10,000,000	4,000,000	6,500,000

The management of The Crunchy Granola Company is evaluating each division as a basis for planning a future expansion of operations.

#### **Instructions**

- 1. Prepare condensed divisional income statements for the three divisions, assuming that there were no service department charges.
- 2. Using the DuPont formula for rate of return on investment, compute the profit margin, investment turnover, and rate of return on investment for each division.
- 3. If available funds permit the expansion of operations of only one division, which of the divisions would you recommend for expansion, based on parts (1) and (2)? Explain.

✓ 2. Cereal Division ROI, 10.0%



#### PR 23-4A Effect of proposals on divisional performance

**OBJ. 4** 

✓ 1. ROI, 16.8%



A condensed income statement for the Commercial Division of Maxell Manufacturing Inc. for the year ended December 31, 2016, is as follows:

Sales	\$3,500,000
Cost of goods sold	2,480,000
Gross profit	\$1,020,000
Operating expenses	600,000
Income from operations	\$ 420,000
Invested assets	\$2,500,000

Assume that the Commercial Division received no charges from service departments. The president of Maxell Manufacturing has indicated that the division's rate of return on a \$2,500,000 investment must be increased to at least 21% by the end of the next year if operations are to continue. The division manager is considering the following three proposals:

*Proposal 1:* Transfer equipment with a book value of \$312,500 to other divisions at no gain or loss and lease similar equipment. The annual lease payments would exceed the amount of depreciation expense on the old equipment by \$105,000. This increase in expense would be included as part of the cost of goods sold. Sales would remain unchanged.

*Proposal 2:* Purchase new and more efficient machining equipment and thereby reduce the cost of goods sold by \$560,000 after considering the effects of depreciation expense on the new equipment. Sales would remain unchanged, and the old equipment, which has no remaining book value, would be scrapped at no gain or loss. The new equipment would increase invested assets by an additional \$1,875,000 for the year.

*Proposal 3:* Reduce invested assets by discontinuing a product line. This action would eliminate sales of \$595,000, reduce cost of goods sold by \$406,700, and reduce operating expenses by \$175,000. Assets of \$1,338,000 would be transferred to other divisions at no gain or loss.

#### **Instructions**

- 1. Using the DuPont formula for rate of return on investment, determine the profit margin, investment turnover, and rate of return on investment for the Commercial Division for the past year.
- 2. Prepare condensed estimated income statements and compute the invested assets for each proposal.
- 3. Using the DuPont formula for rate of return on investment, determine the profit margin, investment turnover, and rate of return on investment for each proposal.
- 4. Which of the three proposals would meet the required 21% rate of return on investment?
- 5. If the Commercial Division were in an industry where the profit margin could not be increased, how much would the investment turnover have to increase to meet the president's required 21% rate of return on investment? Round to one decimal place.

#### PR 23-5A Divisional performance analysis and evaluation

OBJ. 4

The vice president of operations of Pavone Company is evaluating the performance of two divisions organized as investment centers. Invested assets and condensed income statement data for the past year for each division are as follows:

	<b>Business Division</b>	<b>Consumer Division</b>
Sales	\$2,500,000	\$2,550,000
Cost of goods sold	1,320,000	1,350,000
Operating expenses	930,000	843,000
Invested assets	1,250,000	2,125,000

#### Instructions

- 1. Prepare condensed divisional income statements for the year ended December 31, 2016, assuming that there were no service department charges.
- 2. Using the DuPont formula for rate of return on investment, determine the profit margin, investment turnover, and rate of return on investment for each division.
- 3. If management desires a minimum acceptable rate of return of 17%, determine the residual income for each division.
- 4. Discuss the evaluation of the two divisions, using the performance measures determined in parts (1), (2), and (3).

✓ 2. Business
Division ROI, 20.0%





✓ 3. Total income from operations, \$1,759,680



#### PR 23-6A Transfer pricing

OBJ. 5

Garcon Inc. manufactures electronic products, with two operating divisions, the Consumer and Commercial divisions. Condensed divisional income statements, which involve no intracompany transfers and which include a breakdown of expenses into variable and fixed components, are as follows:

# Garcon Inc. Divisional Income Statements For the Year Ended December 31, 2016

	Consumer Division	Commercial Division	Total
Sales:			
14,400 units @ \$144 per unit	\$2,073,600		\$2,073,600
21,600 units @ \$275 per unit		\$5,940,000	5,940,000
	\$2,073,600	\$5,940,000	\$8,013,600
Expenses:			
Variable:			
14,400 units @ \$104 per unit	\$1,497,600		\$1,497,600
21,600 units @ \$193* per unit		\$4,168,800	4,168,800
Fixed	200,000	520,000	720,000
Total expenses	\$1,697,600	\$4,688,800	\$6,386,400
Income from operations	\$ 376,000	\$1,251,200	\$1,627,200

^{*\$150} of the \$193 per unit represents materials costs, and the remaining \$43 per unit represents other variable conversion expenses incurred within the Commercial Division.

The Consumer Division is presently producing 14,400 units out of a total capacity of 17,280 units. Materials used in producing the Commercial Division's product are currently purchased from outside suppliers at a price of \$150 per unit. The Consumer Division is able to produce the materials used by the Commercial Division. Except for the possible transfer of materials between divisions, no changes are expected in sales and expenses.

#### **Instructions**

- 1. Would the market price of \$150 per unit be an appropriate transfer price for Garcon Inc.? Explain.
- 2. If the Commercial Division purchases 2,880 units from the Consumer Division, rather than externally, at a negotiated transfer price of \$115 per unit, how much would the income from operations of each division and the total company income from operations increase?
- 3. Prepare condensed divisional income statements for Garcon Inc. based on the data in part (2).
- 4. If a transfer price of \$126 per unit is negotiated, how much would the income from operations of each division and the total company income from operations increase?
- 5. a. What is the range of possible negotiated transfer prices that would be acceptable for Garcon Inc.?
  - b. Assuming that the managers of the two divisions cannot agree on a transfer price, what price would you suggest as the transfer price?

## **Problems: Series B**



#### PR 23-1B Budget performance report for a cost center

OBJ. 2

The Eastern District of Adelson Inc. is organized as a cost center. The budget for the Eastern District of Adelson Inc. for the month ended December 31, 2016, is as follows:

Sales salaries	\$ 819,840
System administration salaries	448,152
Customer service salaries	152,600
Billing salaries	98,760
Maintenance	271,104
Depreciation of plant and equipment	92,232
Insurance and property taxes	41,280
Total	\$1,923,968

During December, the costs incurred in the Eastern District were as follows:

Sales salaries	\$ 818,880
System administration salaries	447,720
Customer service salaries	183,120
Billing salaries	98,100
Maintenance	273,000
Depreciation of plant and equipment	92,232
Insurance and property taxes	41,400
Total	\$1,954,452

#### **Instructions**

- 1. Prepare a budget performance report for the manager of the Eastern District of Adelson for the month of December.
- 2. For which costs might the supervisor be expected to request supplemental reports?

#### PR 23-2B Profit center responsibility reporting for a service company

OBJ. 3

Thomas Railroad Company organizes its three divisions, the North (N), South (S), and West (W) regions, as profit centers. The chief executive officer (CEO) evaluates divisional performance, using income from operations as a percent of revenues. The following quarterly income and expense accounts were provided from the trial balance as of December 31, 2016:

Revenues—N Region	\$3,780,000
Revenues—S Region	5,673,000
Revenues—W Region	5,130,000
Operating Expenses—N Region	2,678,500
Operating Expenses—S Region	4,494,890
Operating Expenses—W Region	3,770,050
Corporate Expenses—Dispatching	182,000
Corporate Expenses—Equipment Management	1,200,000
Corporate Expenses—Treasurer's	734,000
General Corporate Officers' Salaries	1,380,000

The company operates three service departments: the Dispatching Department, the Equipment Management Department, and the Treasurer's Department. The Dispatching Department manages the scheduling and releasing of completed trains. The Equipment Management Department manages the railroad cars inventories. It makes sure the right freight cars are at the right place at the right time. The Treasurer's Department conducts a variety of services for the company as a whole. The following additional information has been gathered:

	North	South	West
Number of scheduled trains	650	1,105	845
Number of railroad cars in inventory	6,000	8,400	9,600

#### **Instructions**

- 1. Prepare quarterly income statements showing income from operations for the three regions. Use three column headings: North, South, and West.
- 2. Identify the most successful region according to the profit margin.
- Provide a recommendation to the CEO for a better method for evaluating the performance of the regions. In your recommendation, identify the major weakness of the present method.

✓ 1. Income from operations, West Region, \$820,800







## ✓ 2. Mutual Fund Division, ROI, 22.4%



#### PR 23-3B Divisional income statements and rate of return on investment analysis OBJ. 4

E.F. Lynch Company is a diversified investment company with three operating divisions organized as investment centers. Condensed data taken from the records of the three divisions for the year ended June 30, 2016, are as follows:

	Mutual Fund Division	Electronic Brokerage Division	Investment Banking Division
Fee revenue	\$4,140,000	\$3,360,000	\$4,560,000
Operating expenses	2,980,800	3,091,200	3,739,200
Invested assets	5,175,000	1,120,000	3,800,000

The management of E.F. Lynch Company is evaluating each division as a basis for planning a future expansion of operations.

#### **Instructions**

- 1. Prepare condensed divisional income statements for the three divisions, assuming that there were no service department charges.
- 2. Using the DuPont formula for rate of return on investment, compute the profit margin, investment turnover, and rate of return on investment for each division.
- 3. If available funds permit the expansion of operations of only one division, which of the divisions would you recommend for expansion, based on parts (1) and (2)? Explain.

#### PR 23-4B Effect of proposals on divisional performance

OBJ. 4

A condensed income statement for the Electronics Division of Gihbli Industries Inc. for the year ended December 31, 2016, is as follows:

Sales	\$1	,575,000
Cost of goods sold		891,000
Gross profit	\$	684,000
Operating expenses		558,000
Income from operations	\$	126,000
Invested assets	\$1	,050,000

Assume that the Electronics Division received no charges from service departments.

The president of Gihbli Industries Inc. has indicated that the division's rate of return on a \$1,050,000 investment must be increased to at least 20% by the end of the next year if operations are to continue. The division manager is considering the following three proposals:

*Proposal 1:* Transfer equipment with a book value of \$300,000 to other divisions at no gain or loss and lease similar equipment. The annual lease payments would be less than the amount of depreciation expense on the old equipment by \$31,400. This decrease in expense would be included as part of the cost of goods sold. Sales would remain unchanged.

*Proposal 2:* Reduce invested assets by discontinuing a product line. This action would eliminate sales of \$180,000, reduce cost of goods sold by \$119,550, and reduce operating expenses by \$60,000. Assets of \$112,500 would be transferred to other divisions at no gain or loss.

*Proposal 3:* Purchase new and more efficient machinery and thereby reduce the cost of goods sold by \$189,000 after considering the effects of depreciation expense on the new equipment. Sales would remain unchanged, and the old machinery, which has no remaining book value, would be scrapped at no gain or loss. The new machinery would increase invested assets by \$918,750 for the year.

#### **Instructions**

- 1. Using the DuPont formula for rate of return on investment, determine the profit margin, investment turnover, and rate of return on investment for the Electronics Division for the past year. Round investment turnover and the rate of return to one decimal place.
- 2. Prepare condensed estimated income statements and compute the invested assets for each proposal.

✓ 3. Proposal 3 ROI, 16.0%



- 3. Using the DuPont formula for rate of return on investment, determine the profit margin, investment turnover, and rate of return on investment for each proposal. Round investment turnover and the rate of return to one decimal place.
- 4. Which of the three proposals would meet the required 20% rate of return on investment?
- 5. If the Electronics Division were in an industry where the profit margin could not be increased, how much would the investment turnover have to increase to meet the president's required 20% rate of return on investment? Round to one decimal place.

#### PR 23-5B Divisional performance analysis and evaluation

**OBJ. 4** 

The vice president of operations of Free Ride Bike Company is evaluating the performance of two divisions organized as investment centers. Invested assets and condensed income statement data for the past year for each division are as follows:

	<b>Road Bike Division</b>	<b>Mountain Bike Division</b>
Sales	\$1,728,000	\$1,760,000
Cost of goods sold	1,380,000	1,400,000
Operating expenses	175,200	236,800
Invested assets	1,440,000	800,000

#### Instructions

- 1. Prepare condensed divisional income statements for the year ended December 31, 2016, assuming that there were no service department charges.
- 2. Using the DuPont formula for rate of return on investment, determine the profit margin, investment turnover, and rate of return on investment for each division.
- 3. If management's minimum acceptable rate of return is 10%, determine the residual income for each division.
- 4. Discuss the evaluation of the two divisions, using the performance measures determined in parts (1), (2), and (3).

### PR 23-6B Transfer pricing

OBJ. 5

Exoplex Industries Inc. is a diversified aerospace company, including two operating divisions, Semiconductors and Navigational Systems divisions. Condensed divisional income statements, which involve no intracompany transfers and include a breakdown of expenses into variable and fixed components, are as follows:

# Exoplex Industries Inc. Divisional Income Statements For the Year Ended December 31, 2016

	Semiconductors Division	Navigational Systems Division	Total
Sales:			
2,240 units @ \$396 per unit	\$887,040		\$ 887,040
3,675 units @ \$590 per unit	\$887,040	\$2,168,250 \$2,168,250	2,168,250 \$3,055,290
Expenses:			
Variable:			
2,240 units @ \$232 per unit	\$519,680		\$ 519,680
3,675 units @ \$472* per unit		\$1,734,600	1,734,600
Fixed	220,000	325,000	545,000
Total expenses	\$739,680	\$2,059,600	\$2,799,280
Income from operations	\$147,360	\$ 108,650	\$ 256,010

^{*\$432} of the \$472 per unit represents materials costs, and the remaining \$40 per unit represents other variable conversion expenses incurred within the Navigational Systems Division.

The Semiconductors Division is presently producing 2,240 units out of a total capacity of 2,820 units. Materials used in producing the Navigational Systems Division's product are currently purchased from outside suppliers at a price of \$432 per unit. The

(Continued)

✓ 2. Road Bike Division ROI, 12.0%





✓ 3. Navigational Systems Division, \$179.410



Semiconductors Division is able to produce the components used by the Navigational Systems Division. Except for the possible transfer of materials between divisions, no changes are expected in sales and expenses.

#### **Instructions**

- 1. Would the market price of \$432 per unit be an appropriate transfer price for Exoplex Industries Inc.? Explain.
- 2. If the Navigational Systems Division purchases 580 units from the Semiconductors Division, rather than externally, at a negotiated transfer price of \$310 per unit, how much would the income from operations of each division and total company income from operations increase?
- 3. Prepare condensed divisional income statements for Exoplex Industries Inc. based on the data in part (2).
- 4. If a transfer price of \$340 per unit is negotiated, how much would the income from operations of each division and total company income from operations increase?
- 5. a. What is the range of possible negotiated transfer prices that would be acceptable for Exoplex Industries Inc.?
  - b. Assuming that the managers of the two divisions cannot agree on a transfer price, what price would you suggest as the transfer price?

## **Cases & Projects**



#### CP 23-1 Ethics and professional conduct in business

Rambotix Company has two divisions, the Semiconductor Division and the X-ray Division. The X-ray Division may purchase semiconductors from the Semiconductor Division or from outside suppliers. The Semiconductor Division sells semiconductor products both internally and externally. The market price for semiconductors is \$100 per 100 semiconductors. Dave Bryant is the controller of the X-ray Division, and Howard Hillman is the controller of the Semiconductor Division. The following conversation took place between Dave and Howard:

Dave: I hear you are having problems selling semiconductors out of your division. Maybe I can help.

Howard: You've got that right. We're producing and selling at about 90% of our capacity to outsiders. Last year we were selling 100% of capacity. Would it be possible for your division to pick up some of our excess capacity? After all, we are part of the same company.

Dave: What kind of price could you give me?

Howard: Well, you know as well as I that we are under strict profit responsibility in our divisions, so I would expect to get market price, \$100 for 100 semiconductors.

Dave: I'm not so sure we can swing that. I was expecting a price break from a "sister" division.

Howard: Hey, I can only take this "sister" stuff so far. If I give you a price break, our profits will fall from last year's levels. I don't think I could explain that. I'm sorry, but I must remain firm—market price. After all, it's only fair—that's what you would have to pay from an external supplier.

Dave: Fair or not, I think we'll pass. Sorry we couldn't have helped.

Was Dave behaving ethically by trying to force the Semiconductor Division into a price break? Comment on Howard's reactions.

#### **CP 23-2** Service department charges

The Customer Service Department of Door Industries Inc. asked the Publications Department to prepare a brochure for its training program. The Publications Department delivered the brochures and charged the Customer Service Department a rate that was 25% higher than could be obtained from an outside printing company. The policy of the company required the Customer Service Department to use the internal publications group for brochures. The Publications Department claimed that it had a drop in demand for its services during the fiscal year, so it had to charge higher prices in order to recover its payroll and fixed costs.

Should the cost of the brochure be transferred to the Customer Service Department in order to hold the Customer Service Department head accountable for the cost of the brochure? What changes in policy would you recommend?

#### CP 23-3 Evaluating divisional performance

The three divisions of Yummy Foods are Snack Goods, Cereal, and Frozen Foods. The divisions are structured as investment centers. The following responsibility reports were prepared for the three divisions for the prior year:

	Snack Goods	Cereal	Frozen Foods
Revenues	\$2,200,000	\$2,520,000	\$2,100,000
Operating expenses	1,366,600	1,122,000	976,800
Income from operations before service department charges Service department charges:	\$ 833,400	\$1,398,000	\$1,123,200
Promotion	\$ 300,000	\$ 600,000	\$ 468,000
Legal	137,400	243,600	235,200
Total service department charges	\$ 437,400	\$ 843,600	\$ 703,200
Income from operations	\$ 396,000	\$ 554,400	\$ 420,000
Invested assets	\$2,000,000	\$1,680,000	\$1,750,000

- 1. Which division is making the best use of invested assets and should be given priority for future capital investments?
- 2. Assuming that the minimum acceptable rate of return on new projects is 19%, would all investments that produce a return in excess of 19% be accepted by the divisions?
- 3. Can you identify opportunities for improving the company's financial performance?

#### **CP 23-4** Evaluating division performance over time

The Norsk Division of Gridiron Concepts Inc. has been experiencing revenue and profit growth during the years 2014–2016. The divisional income statements follow:

Gridiron Concepts Inc.
Divisional Income Statements, Norsk Division
For the Years Ended December 31, 2014–2016

	2014	2015	2016
Sales	\$1,470,000	\$2,100,000	\$2,450,000
Cost of goods sold	1,064,000	1,498,000	1,680,000
Gross profit	\$ 406,000	\$ 602,000	\$ 770,000
Operating expenses	185,500	224,000	231,000
Income from operations	\$ 220,500	\$ 378,000	\$ 539,000

Assume that there are no charges from service departments. The vice president of the division, Tom Yang, is proud of his division's performance over the last three years. The president of Gridiron Concepts Inc., Anna Evans, is discussing the division's performance with Tom, as follows:

Tom: As you can see, we've had a successful three years in the Norsk Division.

Anna: I'm not too sure.

*Tom*: What do you mean? Look at our results. Our income from operations has more than doubled, while our profit margins are improving.

*Anna:* I am looking at your results. However, your income statements fail to include one very important piece of information, namely, the invested assets. You have been investing a great deal of assets into the division. You had \$735,000 in invested assets in 2014, \$1,500,000 in 2015, and \$3,500,000 in 2016.

Tom: You are right. I've needed the assets in order to upgrade our technologies and expand our operations. The additional assets are one reason we have been able to grow and improve our profit margins. I don't see that this is a problem.

*Anna:* The problem is that we must maintain a 15% rate of return on invested assets.

(Continued)

- 1. Determine the profit margins for the Norsk Division for 2014–2016.
- 2. Compute the investment turnover for the Norsk Division for 2014–2016. Round to two decimal places.
- 3. Compute the rate of return on investment for the Norsk Division for 2014–2016.
- 4. Evaluate the division's performance over the 2014–2016 time period. Why was Anna concerned about the performance?

#### **CP 23-5** Evaluating division performance

Last Resort Industries Inc. is a privately held diversified company with five separate divisions organized as investment centers. A condensed income statement for the Specialty Products Division for the past year, assuming no service department charges, is as follows:

#### Last Resort Industries Inc.—Specialty Products Division Income Statement For the Year Ended December 31, 2015

i or the real Enaca Determine or i, 2015	
Sales	\$32,400,000
Cost of goods sold	24,300,000
Gross profit	\$ 8,100,000
Operating expenses	3,240,000
Income from operations	\$ 4,860,000
Invested assets	\$27,000,000

The manager of the Specialty Products Division was recently presented with the opportunity to add an additional product line, which would require invested assets of \$14,400,000. A projected income statement for the new product line is as follows:

# New Product Line Projected Income Statement For the Year Ended December 31, 2016

•	
Sales	\$12,960,000
Cost of goods sold	7,500,000
Gross profit	\$ 5,460,000
Operating expenses	3,127,200
Income from operations	\$ 2,332,800

The Specialty Products Division currently has \$27,000,000 in invested assets, and Last Resort Industries Inc.'s overall rate of return on investment, including all divisions, is 10%. Each division manager is evaluated on the basis of divisional rate of return on investment. A bonus is paid, in \$8,000 increments, for each whole percentage point that the division's rate of return on investment exceeds the company average.

The president is concerned that the manager of the Specialty Products Division rejected the addition of the new product line, even though all estimates indicated that the product line would be profitable and would increase overall company income. You have been asked to analyze the possible reasons why the Specialty Products Division manager rejected the new product line.

- 1. Determine the rate of return on investment for the Specialty Products Division for the past year.
- 2. Determine the Specialty Products Division manager's bonus for the past year.
- 3. Determine the estimated rate of return on investment for the new product line. Round whole percents to one decimal place and investment turnover to two decimal places.
- 4. Why might the manager of the Specialty Products Division decide to reject the new product line? Support your answer by determining the projected rate of return on investment for 2016, assuming that the new product line was launched in the Specialty Products Division, and 2016 actual operating results were similar to those of 2015.
- 5. Can you suggest an alternative performance measure for motivating division managers to accept new investment opportunities that would increase the overall company income and rate of return on investment?



# Differential Analysis and Product Pricing

# Facebook

any of the decisions that you make depend on comparing the estimated costs of alternatives. The payoff from such comparisons is described in the following report from a University of Michigan study:

Richard Nisbett and two colleagues quizzed Michigan faculty members and university seniors on such questions as how often they walk out on a bad movie, refuse to finish a bad meal, start over on a weak term paper, or abandon a research project that no longer looks promising. They believe that people who cut their losses this way are following sound economic rules: calculating the net benefits of alternative courses of action, writing off past costs that can't be recovered, and weighing the opportunity to use future time and effort more profitably elsewhere.

Among students, those who have learned to use cost-benefit analysis frequently are apt to have far better grades than their Scholastic Aptitude Test scores would have predicted. Again, the more economics courses the students have, the more likely they are to apply cost-benefit analysis outside the classroom.

Dr. Nisbett concedes that for many Americans, cost-benefit rules often appear to conflict with such traditional principles as "never give up" and "waste not, want not."

Managers must also evaluate the costs and benefits of alternative actions. **Facebook**, the largest social networking site in the world, was co-

founded by Mark Zuckerberg in 2004. Since then, it has grown to more than 1 billion users and made Zuckerberg a multibillionaire.

Facebook has plans to grow to well over 1 billion users worldwide. Such growth involves decisions about where to expand. For example, expanding the site to new languages and countries involves software programming, marketing, and computer hardware costs. The benefits include adding new users to Facebook.

Analysis of the benefits and costs might lead Facebook to expand in some languages before others. For example, such an analysis might lead Facebook to expand in Swedish before it expands in Tok Pisin (the language of Papua New Guinea).

In this chapter, differential analysis, which reports the effects of decisions on total revenues and costs, is discussed. Practical approaches to setting product prices are also described and illustrated. Finally, how production bottlenecks influence pricing and other decisions is also discussed.

Source: Alan L. Otten, "Economic Perspective Produces Steady Yields," from People Patterns, *The Wall Street Journal*, March 31,1992, p. B1.

Learning Objectives			
After studying this chapter, you should be able to:	Example Exercises		
Prepare differential analysis reports for a variety of managerial decisions.  Differential Analysis  Lease or Sell  Discontinue a Segment or Product  Make or Buy  Replace Equipment  Process or Sell  Accept Business at a Special Price	EE 24-1 EE 24-2 EE 24-3 EE 24-4 EE 24-5 EE 24-6		
Determine the selling price of a product, using the product cost concept.  Setting Normal Product Selling Prices Product Cost Concept Target Costing	EE 24-7		
Compute the relative profitability of products in bottleneck production processes.  Production Bottlenecks	EE 24-8		
	At a Glance 24 Page 1139		

Prepare differential analysis reports for a variety of managerial decisions.

## **Differential Analysis**

Managerial decision making involves choosing between alternative courses of action. Although the managerial decision-making process varies by the type of decision, it normally involves the following steps:

- Step 1. Identify the objective of the decision, which is normally maximizing income.
- Step 2. Identify alternative courses of action.
- Step 3. Gather information and perform a differential analysis.
- Step 4. Make a decision.
- Step 5. Review, analyze, and assess the results of the decision.

To illustrate, assume Bryant Restaurants Inc. is deciding whether to replace some of its customer seating (tables) with a salad bar. The differential analysis decision-making process is as follows.

Step 1 Identify the objective of the decision.

Bryant Restaurants' objective is to increase its income.

**Step 2** Identify alternative courses of action.

The alternative courses of action are:

- 1. Use floor space for existing tables.
- 2. Replace the tables with a salad bar.

**Step 3** Gather information and perform a differential analysis. The following relevant data have been gathered:

Income (loss)

	Tables (Alternative 1)	Salad Bar (Alternative 2)
Revenues	\$100,000	\$120,000
Costs	60,000	65,000

\$ 40,000

\$ 55,000

The preceding information is used to perform differential analysis. **Differential analysis**, sometimes called *incremental analysis*, analyzes differential revenues and costs in order to determine the differential impact on income of two alternative courses of action.

**Differential revenue** is the amount of increase or decrease in revenue that is expected from a course of action compared to an alternative. **Differential cost** is the amount of increase or decrease in cost that is expected from a course of action as compared to an alternative. **Differential income (loss)** is the difference between the differential revenue and differential costs. Differential income indicates that a decision is expected to increase income, while a differential loss indicates the decision is expected to decrease income.

To illustrate, the differential analysis as of July 11 of the current year for Bryant Restaurants is shown in Exhibit 1.

#### Differential Analysis Tables (Alternative 1) or Salad Bar (Alternative 2) July 11

	Tables (Alternative 1)	Salad Bar (Alternative 2)	Differential Effect on Income (Alternative 2)
Revenues	\$100,000	\$120,000	\$20,000
Costs	<u>-60,000</u> <u>\$ 40,000</u>	65,000 \$_55,000	_5,000 \$15,000

#### EXHIBIT 1

Differential Analysis—Bryant Restaurants

The differential analysis is prepared in three columns, where positive amounts indicate the effect is to increase income and negative amounts indicate the effect is to decrease income. The first column is the revenues, costs, and income for maintaining floor space for tables (Alternative 1). The second column is the revenues, costs, and income for using that floor space for a salad bar (Alternative 2). The third column is the difference between the revenue, costs, and income of one alternative over the other.

In Exhibit 1, the salad bar is being considered over retaining the existing tables. Thus, Column 3 in Exhibit 1 is expressed in terms of Alternative 2 (salad bar) over Alternative 1 (tables).

In Exhibit 1, the differential revenue of a salad bar over tables is \$20,000 (\$120,000 - \$100,000). Because the increased revenue would increase income, it is entered as a positive \$20,000 in the Differential Effect on Income column. The differential cost of a salad bar over tables is \$5,000 (\$65,000 - \$60,000). Because the increased costs will decrease income, it is entered as a negative \$5,000 in the Differential Effect on Income column.

The differential income (loss) of a salad bar over tables of \$15,000 is determined by subtracting the differential costs from the differential revenues in the Differential Effect on Income column. Thus, installing a salad bar increases income by \$15,000.

The preceding differential revenue, costs, and income can also be determined using the following formulas:

```
Differential Revenue = Revenue (Alt. 2) - Revenue (Alt. 1)

= $120,000 - $100,000 = $20,000

Differential Costs = Costs (Alt. 2) - Costs (Alt. 1)

= -$65,000 - (-$60,000) = -$5,000

Differential Income (Loss) = Income (Alt. 2) - Income (Alt. 1)

= $55,000 - $40,000 = $15,000
```

#### Step 4 Make a decision.

Based upon the differential analysis report shown in Exhibit 1, Bryant Restaurants should decide to replace some of its tables with a salad bar. Doing so will increase its income by \$15,000.

#### **Step 5** Review, analyze, and assess the results of the decision.

Over time, Bryant Restaurants' decision should be reviewed based upon actual revenues and costs. If the actual revenues and costs differ significantly from those gathered in Step 3, another differential analysis might be necessary to verify that the correct decision was made.

In this chapter, differential analysis is illustrated for the following common decisions:

- Leasing or selling equipment
- · Discontinuing an unprofitable segment
- · Manufacturing or purchasing a needed part
- Replacing fixed assets
- Selling a product or processing further
- Accepting additional business at a special price

#### **Lease or Sell**

Management may lease or sell a piece of equipment that is no longer needed. This may occur when a company changes its manufacturing process and can no longer use the equipment in the manufacturing process. In making a decision, differential analysis can be used.

To illustrate, assume that on June 22 of the current year, Marcus Company is considering leasing or disposing of the following equipment:

Cost of equipment	\$200,000
Less accumulated depreciation	120,000
Book value	\$ 80,000
Lease (Alternative 1):	
Total revenue for five-year lease	\$160,000
Total estimated repair, insurance, and	
property tax expenses during life of lease	35,000
Residual value at end of fifth year of lease	0
Sell (Alternative 2):	
Sales price	\$100,000
Commission on sales	6%

Exhibit 2 shows the differential analysis of whether to lease (Alternative 1) or sell (Alternative 2) the equipment.

#### EXHIBIT 2

Differential Analysis—Lease or Sell Equipment

# Differential Analysis Lease Equipment (Alternative 1) or Sell Equipment (Alternative 2) June 22

	Lease Equipment (Alternative 1)	Sell Equipment (Alternative 2)	Differential Effect on Income (Alternative 2)
evenuesosts	\$160,000 -35,000	\$100,000 -6,000	-\$60,000 29,000
Income (loss)	\$125,000	\$ 94,000	<u>-\$31,000</u>

If the equipment is sold, differential revenues will decrease by \$60,000, differential costs will decrease by \$29,000, and the differential effect on income is a decrease of \$31,000. Thus, the decision should be to lease the equipment.

Exhibit 2 includes only the differential revenues and differential costs associated with the lease-or-sell decision. The \$80,000 book value (\$200,000 - \$120,000) of the equipment is a sunk cost and is not considered in the differential analysis. Sunk costs are costs that have been incurred in the past, cannot be recouped, and are not relevant to future decisions. That is, the \$80,000 is not affected regardless of which decision is made. For example, if the \$80,000 were included in Exhibit 2, the costs for each alternative would both increase by \$80,000, but the differential effect on income of -\$31,000 would remain unchanged.



Have you ever walked out on a bad movie? The

cost of the ticket is a sunk cost and, thus, irrelevant to the decision to walk out early.

To simplify, the following factors were not considered in Exhibit 2:

- · Differential revenue from investing funds
- Differential income tax

Differential revenue, such as interest revenue, could arise from investing the cash created by the two alternatives. Differential income tax could also arise from differences in income. These factors are discussed in Chapter 25.

## Example Exercise 24-1 Lease or Sell



Casper Company owns office space with a cost of \$100,000 and accumulated depreciation of \$30,000 that can be sold for \$150,000, less a 6% broker commission. Alternatively, the office space can be leased by Casper Company for 10 years for a total of \$170,000, at the end of which there is no residual value. In addition, repair, insurance, and property tax that would be incurred by Casper Company on the rented office space would total \$24,000 over the 10 years. Prepare a differential analysis on May 30, as to whether Casper Company should lease (Alternative 1) or sell (Alternative 2) the office space.

#### Follow My Example 24-1

#### **Differential Analysis** Lease Office Space (Alternative 1) or Sell Office Space (Alternative 2) May 30

	Lease Office Space (Alternative 1)	Sell Office Space (Alternative 2)	Differential Effect on Income (Alternative 2)
Revenues	\$170,000	\$150,000	-\$20,000
Costs	24,000	*	15,000
Income (loss)	\$146,000	\$141,000	<u>-</u> \$ 5,000
*\$150.000 × 6%			

Casper Company should lease the office space.

Practice Exercises: PE 24-1A, PE 24-1B

## Discontinue a Segment or Product

A product, department, branch, territory, or other segment of a business may be generating losses. As a result, management may consider discontinuing (eliminating) the product or segment. In such cases, it may be erroneously assumed that the total company income will increase by eliminating the operating loss.

Discontinuing the product or segment usually eliminates all of the product's or segment's variable costs. Such costs include direct materials, direct labor, variable factory overhead, and sales commissions. However, fixed costs such as depreciation, insurance, and property taxes may not be eliminated. Thus, it is possible for total company income to decrease rather than increase if the unprofitable product or segment is discontinued.

To illustrate, the income statement for Battle Creek Cereal Co. is shown in Exhibit 3. As shown in Exhibit 3, Bran Flakes incurred an operating loss of \$11,000. Because Bran Flakes has incurred annual losses for several years, management is considering discontinuing it.

#### **EXHIBIT 3**

Income (Loss) by Product

Battle Creek Cereal Co. Condensed Income Statement For the Year Ended August 31, 2016				
	Corn Flakes	Toasted Oats	Bran Flakes	Total Company
Sales	\$500,000	\$400,000	\$100,000	\$1,000,000
Variable costs	\$220,000	\$200,000	\$ 60,000	\$ 480,000
Fixed costs	120,000	80,000	20,000	220,000
Total cost of goods sold	\$340,000	\$280,000	\$ 80,000	\$ 700,000
Gross profit	\$160,000	\$120,000	\$ 20,000	\$ 300,000
Variable expenses	\$ 95,000	\$ 60,000	\$ 25,000	\$ 180,00
Fixed expenses	25,000	20,000	6,000	51,00
Total operating expenses	\$120,000	\$ 80,000	\$ 31,000	\$ 231,00
Income (loss) from operations	\$ 40,000	\$ 40,000	\$ (11,000)	\$ 69,000

However, the differential analysis dated September 29, 2016, in Exhibit 4 indicates that discontinuing Bran Flakes (Alternative 2) actually decreases operating income by \$15,000, even though it incurs a net loss of \$11,000. This is because discontinuing Bran Flakes has no effect on fixed costs and expenses.

Exhibit 4 only considers the short-term (one-year) effects of discontinuing Bran Flakes. When discontinuing a product or segment, long-term effects should also be considered. For example, employee morale and productivity might suffer if employees have to be laid off or relocated.

#### **EXHIBIT 4**

Differential Analysis—Continue or Discontinue Bran Flakes

Continue Discontinue Differentials	- 66	
September 29, 2016		
Continue Bran Flakes (Alternative 1) or Discontinue Bran Flakes (Alternative 2)		
Differential Analysis		

	Continue	Discontinue	Differential Effect
	Bran Flakes	Bran Flakes	on Income
	(Alternative 1)	(Alternative 2)	(Alternative 2)
Revenues	\$100,000	\$ 0	_\$100,000
Variable	-\$ 85,000	\$ 0	\$ 85,000
	-26,000	-26,000	0
	-\$111,000	-\$26,000	\$ 85,000
	-\$ 11,000	-\$26,000	-\$ 15,000

## Example Exercise 24-2 Discontinue a Segment



Product K has revenue of \$65,000, variable cost of goods sold of \$50,000, variable selling expenses of \$12,000, and fixed costs of \$25,000, creating a loss from operations of \$22,000. Prepare a differential analysis dated February 22 to determine if Product K should be continued (Alternative 1) or discontinued (Alternative 2), assuming fixed costs are unaffected by the decision.

#### Follow My Example 24-2

## Differential Analysis Continue K (Alternative 1) or Discontinue K (Alternative 2) February 22

	Continue Product K (Alternative 1)	Discontinue Product K (Alternative 2)	Differential Effect on Income (Alternative 2)
Revenues	\$65,000	\$ 0	-\$65,000
Costs:			
Variable	-\$62,000*	\$ 0	\$62,000
Fixed	25,000	-25,000	0
Total costs	-\$87,000	-\$25,000	\$62,000
Income (loss)	-\$22,000	-\$25,000	<u>-</u> \$ 3,000
*\$50,000 + \$12,000			
Product K should be continued.			

Practice Exercises: PE 24-2A, PE 24-2B

## **Make or Buy**

Companies often manufacture products made up of components that are assembled into a final product. For example, an automobile manufacturer assembles tires, radios, motors, interior seats, transmissions, and other parts into a finished automobile. In such cases, the manufacturer must decide whether to make a part or purchase it from a supplier.

Differential analysis can be used to decide whether to make or buy a part. The analysis is similar whether management is considering making a part that is currently being purchased or purchasing a part that is currently being made.

To illustrate, assume that an automobile manufacturer has been purchasing instrument panels for \$240 a unit. The factory is currently operating at 80% of capacity, and no major increase in production is expected in the near future. The cost per unit of manufacturing an instrument panel internally is estimated on February 15 as follows:

Direct materials	\$	80
Direct labor		80
Variable factory overhead		52
Fixed factory overhead		68
Total cost per unit	\$2	280

If the make price of \$280 is simply compared with the buy price of \$240, the decision is to buy the instrument panel. However, if unused capacity could be used in manufacturing the part, only the variable factory overhead costs would increase.

The differential analysis for this make (Alternative 1) or buy (Alternative 2) decision is shown in Exhibit 5. The fixed factory overhead cannot be eliminated by purchasing the panels. Thus, both alternatives include the fixed factory overhead. The differential analysis indicates there is a loss of \$28 per unit from buying the instrument panels. Thus, the instrument panels should be manufactured.

#### **EXHIBIT 5**

Differential Analysis—Make or Buy Instrument Panels

# Differential Analysis Make Panels (Alternative 1) or Buy Panels (Alternative 2) February 15

	February 15		
	Make Panels (Alternative 1)	Buy Panels (Alternative 2)	Differential Effect on Income (Alternative 2)
nit costs:			
Purchase price	\$ 0	-\$240	-\$240
Direct materials	-80	0	80
Direct labor	-80	0	80
Variable factory overhead	-52	0	52
Fixed factory overhead	68	68	0
Income (loss)	<u>-\$280</u>	<u>-\$308</u>	<u>-\$ 28</u>

Other factors should also be considered in the analysis. For example, productive capacity used to make the instrument panel would not be available for other production. The decision may also affect the future business relationship with the instrument panel supplier. For example, if the supplier provides other parts, the company's decision to make instrument panels might jeopardize the timely delivery of other parts.

## Example Exercise 24-3 Make or Buy



A company manufactures a subcomponent of an assembly for \$80 per unit, including fixed costs of \$25 per unit. A proposal is offered to purchase the subcomponent from an outside source for \$60 per unit, plus \$5 per unit freight. Prepare a differential analysis dated November 2, to determine whether the company should make (Alternative 1) or buy (Alternative 2) the subcomponent, assuming fixed costs are unaffected by the decision.

#### Follow My Example 24-3

# Differential Analysis Make Subcomponent (Alternative 1) or Buy Subcomponent (Alternative 2) November 2

	Make Subcomponent (Alternative 1)	Buy Subcomponent (Alternative 2)	Differential Effect on Income (Alternative 2)
Unit costs:			
Purchase price	\$ 0	-\$60	-\$60
Freight	0	-5	-5
Variable costs (\$80 – \$25)	-55	0	55
Fixed factory overhead	-25	_25	0
Income (loss)	<u>-25</u> <u>-\$80</u>	<u>-\$90</u>	<u>-\$10</u>

The company should make the subcomponent.

Practice Exercises: PE 24-3A, PE 24-3B

## **Replace Equipment**

The usefulness of a fixed asset may decrease before it is worn out. For example, old equipment may no longer be as efficient as new equipment.

Differential analysis can be used for decisions to replace fixed assets such as equipment and machinery. The analysis normally focuses on the costs of continuing

to use the old equipment versus replacing the equipment. The book value of the old equipment is a sunk cost and, thus, is irrelevant.

To illustrate, assume that on November 28 of the current year, a business is considering replacing an old machine with a new machine:

Old Machine	
Book value	\$100,000
Estimated annual variable manufacturing costs	225,000
Estimated selling price	25,000
Estimated remaining useful life	5 years
New Machine	
Purchase price of new machine	\$250,000
Estimated annual variable manufacturing costs	150,000
Estimated residual value	0
Estimated useful life	5 years

The differential analysis for whether to continue with the old machine (Alternative 1) or replace the old machine with a new machine (Alternative 2) is shown in Exhibit 6.

#### **Differential Analysis** Continue with Old Machine (Alternative 1) or Replace Old Machine (Alternative 2) **November 28 Continue with Replace Old Differential Old Machine** Machine **Effect on Income** (Alternative 1) (Alternative 2) (Alternative 2) Revenues: Proceeds from sale of old machine . . . . . . \$ \$ 25,000 \$ 25,000 Costs: -\$250,000 Purchase price ..... -\$ 250,000 Variable manufacturing costs (5 years) . . . . _ -1,125,000 -750,000375,000 Total costs.....-\$1,125,000 -\$1,000,000 \$125,000 Income (loss) ...... -\$1,125,000 -\$ 975,000 \$150,000

#### **EXHIBIT 6**

Differential Analysis—Continue with or Replace Old Equipment

As shown in Exhibit 6, there is five-year differential effect on income of \$150,000 (or \$30,000 per year) from replacing the machine. Thus, the decision should be to purchase the new machine and sell the old machine.

Other factors are often important in equipment replacement decisions. For example, differences between the remaining useful life of the old equipment and the estimated life of the new equipment could exist. In addition, the new equipment might improve the overall quality of the product and, thus, increase sales.

The time value of money and other uses for the cash needed to purchase the new equipment could also affect the decision to replace equipment.¹ The revenue that is forgone from an alternative use of an asset, such as cash, is called an **opportunity cost**. Although the opportunity cost is not recorded in the accounting records, it is useful in analyzing alternative courses of action.

¹ The time value of money in purchasing equipment (capital assets) is discussed in Chapter 25.

## Example Exercise 24-4 Replace Equipment



A machine with a book value of \$32,000 has an estimated four-year life. A proposal is offered to sell the old machine for \$10,000 and replace it with a new machine at a cost of \$45,000. The new machine has a four-year life with no residual value. The new machine would reduce annual direct labor costs from \$33,000 to \$22,000. Prepare a differential analysis dated October 7 on whether to continue with the old machine (Alternative 1) or replace the old machine (Alternative 2).

### Follow My Example 24-4

# Differential Analysis Continue with Old Machine (Alternative 1) or Replace Old Machine (Alternative 2) October 7

	Continue with Old Machine (Alternative 1)	Replace Old Machine (Alternative 2)	Differential Effect on Income (Alternative 2)
Revenues:			
Proceeds from sale of old machine	\$ 0	\$ 10,000	\$10,000
Costs:			
Purchase price	\$ 0	-\$ 45,000	-\$45,000
Direct labor (4 years)	-132,000*	-88,000**	44,000
Total costs	<del>-</del> \$132,000	-\$133,000	<del>-</del> \$ 1,000
Total income (loss)	-\$132,000	-\$123,000	\$ 9,000
*\$33,000 × 4 years			
**\$22,000 × 4 years			

.....

The old machine should be sold and replaced with the new machine.

Practice Exercises: PE 24-4A, PE 24-4B

### **Process or Sell**

During manufacturing, a product normally progresses through various stages or processes. In some cases, a product can be sold at an intermediate stage of production, or it can be processed further and then sold.

Differential analysis can be used to decide whether to sell a product at an intermediate stage or to process it further. In doing so, the differential revenues and costs from further processing are compared. The costs of producing the intermediate product do not change, regardless of whether the intermediate product is sold or processed further.

To illustrate, assume that a business produces kerosene as an intermediate product as follows:

#### Kerosene:

Batch size 4,000 gallons
Cost of producing kerosene \$2,400 per batch
Selling price \$2.50 per gallon

The kerosene can be processed further to yield gasoline as follows:

#### Gasoline:

Input batch size

Less evaporation (20%)

Output batch size

Cost of producing gasoline

Selling price

4,000 gallons

800 (4,000 × 20%)

3,200 gallons

\$3,050 per batch

\$3,050 per gallon

Exhibit 7 shows the differential analysis dated October 1 for whether to sell kerosene (Alternative 1) or process it further into gasoline (Alternative 2).

As shown in Exhibit 7, there is additional income of \$550 per batch from further processing the kerosene into gasoline. Therefore, the decision should be to process the kerosene further into gasoline.

#### Differential Analysis Sell Kerosene (Alternative 1) or Process Further into Gasoline (Alternative 2) October 1

	ottober i		
	Sell Kerosene (Alternative 1)	Process Further into Gasoline (Alternative 2)	Differential Effect on Income (Alternative 2)
Revenues	\$10,000*	\$11,200**	\$1,200
Costs	2,400	_3,050	650
Income (loss)	\$ 7,600	\$ 8,150	\$ 550
*4,000 gallons × \$2.50			

#### EXHIBIT 7

Differential
Analysis—Sell
Kerosene or Process
Further into Gasoline

## **Example Exercise 24-5** Process or Sell



Product T is produced for \$2.50 per gallon. Product T can be sold without additional processing for \$3.50 per gallon, or processed further into Product V at an additional total cost of \$0.70 per gallon. Product V can be sold for \$4.00 per gallon. Prepare a differential analysis dated April 8 on whether to sell Product T (Alternative 1) or process it further into Product V (Alternative 2).

#### Follow My Example 24-5

# Differential Analysis Sell Product T (Alternative 1) or Process Further into Product V (Alternative 2) April 8

	Sell Product T (Alternative 1)	Process Further into Product V (Alternative 2)	Differential Effect on Income (Alternative 2)
Revenues, per unit	\$3.50	\$4.00	\$0.50
Costs, per unit	<u>-2.50</u>	<u>-3.20</u> *	0.70
Income (loss), per unit	<u>-2.50</u> \$1.00	\$0.80	
*\$2.50 + \$0.70			
The decision should be to sell Product T.			

Practice Exercises: PE 24-5A, PE 24-5B

## **Accept Business at a Special Price**

A company may be offered the opportunity to sell its products at prices other than normal prices. For example, an exporter may offer to sell a company's products overseas at special discount prices.

Differential analysis can be used to decide whether to accept additional business at a special price. The differential revenue from accepting the additional business is compared to the differential costs of producing and delivering the product to the customer.

The differential costs of accepting additional business depend on whether the company is operating at less than capacity. If the company is operating at less than full capacity, then the additional production does not increase fixed manufacturing costs. However, selling and administrative expenses may change because of the additional business.

To illustrate, assume that B-Ball Inc. manufactures basketballs as follows:

Monthly productive capacity 12,500 basketballs Current monthly sales 10,000 basketballs Normal (domestic) selling price \$30.00 per basketball Manufacturing costs: Variable costs \$12.50 per basketball Fixed costs 7.50 Total \$20.00 per basketball

On March 10 of the current year, B-Ball Inc. received an offer from an exporter for 5,000 basketballs at \$18 each. Production can be spread over three months without interfering with normal production or incurring overtime costs. Pricing policies in the domestic market will not be affected.

As shown in Exhibit 8, a differential analysis on whether to reject the order (Alternative 1) or accept the order (Alternative 2) shows that the special order should be accepted. The special business is accepted even though the sales price of \$18 per unit is less than the manufacturing cost of \$20 per unit because the fixed costs are not affected by the decision and are, thus, omitted from the analysis.

#### **EXHIBIT 8**

Differential Analysis—Accept **Business at a Special Price** 

## **Differential Analysis** Reject Order (Alternative 1) or Accept Order (Alternative 2)

	March 10		
	Reject Order (Alternative 1)	Accept Order (Alternative 2)	Differential Effect on Income (Alternative 2)
Revenues	\$0	\$90,000*	\$90,000
Costs:			
Variable manufacturing costs	0	-62,500**	-62,500
Income (loss)	\$0	\$27,500	\$27,500
*5,000 units × \$18 **5,000 units × \$12.50 variable cost per unit			

Proposals to sell products at special prices often require additional considerations. For example, special prices in one geographic area may result in price reductions in other areas, with the result that total company sales revenues decrease. Manufacturers must also conform to the Robinson-Patman Act, which prohibits price discrimination within the United States unless price differences can be justified by different costs.



## Business Connection

#### 60% OFF!

Priceline.com Inc. was founded in the late 1990s and has become a successful survivor of the Internet revolution. Priceline offers deep discounts of up to 60% for travel services, such as hotels and travel. How does it work? For hotel services, Priceline has arrangements with hotels to provide deeply discounted rooms. These rooms are resold to customers on Priceline's Web site.

Why do hotels provide rooms at such a large discount? If the hotel has unused rooms, the variable cost of an incremental guest is low relative to the fixed cost of the room. Thus, during low occupancy times, any price greater than the variable cost of providing the room can add to the profitability of the hotel. Thus, hotels view Priceline as an additional source of profit from filling unused rooms during low demand periods.

## Example Exercise 24-6 Accept Business at Special Price



Product D is normally sold for \$4.40 per unit. A special price of \$3.60 is offered for the export market. The variable production cost is \$3.00 per unit. An additional export tariff of 10% of revenue must be paid for all export products. Assume there is sufficient capacity for the special order. Prepare a differential analysis dated January 14 on whether to reject (Alternative 1) or accept (Alternative 2) the special order.

#### Follow My Example 24-6

#### Differential Analysis Reject Order (Alternative 1) or Accept Order (Alternative 2) January 14

	Reject Order (Alternative 1)	Accept Order (Alternative 2)	Differential Effect on Income (Alternative 2)
Per unit:			
Revenues	\$0	\$3.60	\$3.60
Costs:	_		
Variable manufacturing costs	\$0	-\$3.00	-\$3.00
Export tariff	_0	0.36*	_0.36
Total costs	0 \$0 \$0	-0.36* -\$3.36	-0.36 -\$3.36
Income (loss)	<u>\$0</u>	\$0.24	\$0.24
*\$3.60 × 10%			
The special order should be accepted.			

Practice Exercises: PE 24-6A, PE 24-6B

## **Setting Normal Product Selling Prices**

The *normal* selling price is the target selling price to be achieved in the long term. The normal selling price must be set high enough to cover all costs and expenses (fixed and variable) and provide a reasonable profit. Otherwise, the business will not survive.

In contrast, in deciding whether to accept additional business at a special price, only differential costs are considered. Any price greater than the differential costs will increase profits in the short term. However, in the long term, products are sold at normal prices rather than special prices.

Managers can use one of two market methods to determine selling price:

- Demand-based concept
- Competition-based concept

The demand-based concept sets the price according to the demand for the product. If there is high demand for the product, then the price is set high. Likewise, if there is a low demand for the product, then the price is set low.

The competition-based concept sets the price according to the price offered by competitors. For example, if a competitor reduces the price, then management adjusts the price to meet the competition. The market-based pricing approaches are discussed in greater detail in marketing courses.

Managers can also use one of three cost-plus methods to determine the selling price:

- Product cost concept
- Total cost concept
- Variable cost concept

The product cost concept is illustrated in this section. The total cost and variable cost concepts are illustrated in the appendix to this chapter.

Determine the selling price of a product, using the product cost concept.

## Service Focus



#### REVENUE MANAGEMENT

Did you know that it is common to sit next to a person on a flight who paid much more for that seat than you did for yours (or vice versa)? While this may not seem fair, this practice is consistent with a type of differential analysis called revenue management. Revenue management strives to yield the maximum amount of profit from a perishable good. Examples of perishable goods in service include a seat on a flight, a hotel room for a given night, a ticket for a given event, or a cruise ship berth for a given voyage. The service is perishable because, once the date passes, the "product" expires.

Consider Delta Air Lines. Delta maximizes the profitability on a given flight by taking into account different customer behaviors and preferences. For example, a business person may pay a very high price for an airline ticket booked one day in advance to attend an emergency meeting. Next to her may be a college student on the same flight who booked two month's in advance at a very low price. The difference in behavior yields a different price. The airline sells early bookings at very favorable prices to fill out the flight. However, late emergency business bookings are priced high because the inventory of seats have diminished and, thus, have become valuable. However, if too many seats remain unoccupied very close to the flight time, the airline may release them at deep discounts to standby passengers to fill the flight. Thus, the flight is filled with different priced seats for different customers, all in attempt to fill the flight as profitably as possible.

## **Product Cost Concept**

Cost-plus methods determine the normal selling price by estimating a cost amount per unit and adding a markup, computed as follows:

Normal Selling Price = Cost Amount per Unit + Markup

Management determines the markup based on the desired profit for the product. The markup should be sufficient to earn the desired profit plus cover any costs and expenses that are not included in the cost amount.

As shown in Exhibit 9, under the product cost concept, only the costs of manufacturing the product, termed the product costs, are included in the cost amount per unit to which the markup is added. Estimated selling expenses, administrative expenses, and desired profit are included in the markup. The markup per unit is then computed and added to the product cost per unit to determine the normal selling price.

#### **EXHIBIT 9**

**Product Cost** Concept



The product cost concept is applied using the following steps:

• Step 1. Estimate the total product costs as follows:

#### Product costs:

Direct materials	\$XXX
Direct labor	XXX
Factory overhead	XXX
Total product cost	\$XXX

- Step 2. Estimate the total selling and administrative expenses.
- Step 3. Divide the total product cost by the number of units expected to be produced and sold to determine the total product cost per unit, computed as follows:

$$Product Cost per Unit = \frac{Total Product Cost}{Estimated Units Produced and Sold}$$

• Step 4. Compute the markup percentage as follows:

$$\label{eq:markup} \text{Markup Percentage} = \frac{\text{Desired Profit} + \text{Total Selling and Administrative Expenses}}{\text{Total Product Cost}}$$

The numerator of the markup percentage is the desired profit plus the total selling and administrative expenses. These expenses must be included in the markup percentage because they are not included in the cost amount to which the markup is added.

The desired profit is normally computed based on a rate of return on assets as follows:

Desired Profit = Desired Rate of Return × Total Assets

• Step 5. Determine the markup per unit by multiplying the markup percentage times the product cost per unit as follows:

Markup per Unit = Markup Percentage × Product Cost per Unit

• Step 6. Determine the normal selling price by adding the markup per unit to the product cost per unit as follows:

Product cost per unit	\$XXX
Markup per unit	XXX
Normal selling price per unit	\$XXX

To illustrate, assume the following data for 100,000 calculators that Digital Solutions Inc. expects to produce and sell during the current year:

#### Manufacturing costs:

Direct materials ( $$3.00 \times 100,000$ )	\$ 300,000
Direct labor ( $$10.00 \times 100,000$ )	1,000,000
Factory overhead	200,000
Total manufacturing costs	\$1,500,000
Selling and administrative expenses	170,000
Total cost	\$1,670,000
Total assets	\$800,000
Desired rate of return	20%

The normal selling price of \$18.30 is determined under the product cost concept as follows:

- Step 1. Total product cost: \$1,500,000
- Step 2. Total selling and administrative expenses: \$170,000
- Step 3. Total product cost per unit: \$15.00

Total Cost per Unit = 
$$\frac{\text{Total Product Cost}}{\text{Estimated Units Produced and Sold}} = \frac{\$1,500,000}{100,000 \text{ units}} = \$15.00 \text{ per unit}$$

• Step 4. Markup percentage: 22%

Desired Profit = Desired Rate of Return × Total Assets = 20% × \$800,000 = \$160,000

$$=\frac{\$160,000+\$170,000}{\$1,500,000}=\frac{\$330,000}{\$1,500,000}=22\%$$

• Step 5. Markup per unit: \$3.30

Markup per Unit = Markup Percentage × Product Cost per Unit  $= 22\% \times $15.00 = $3.30$  per unit

• Step 6. Normal selling price: \$18.30

Total product cost per unit	\$15.00
Markup per unit	3.30
Normal selling price per unit	\$18.30

Product cost estimates, rather than actual costs, may be used in computing the markup. Management should be careful, however, when using estimated or standard costs in applying the cost-plus approach. Specifically, estimates should be based on normal (attainable) operating levels and not theoretical (ideal) levels of performance. In product pricing, the use of estimates based on ideal operating performance could lead to setting product prices too low.

## Example Exercise 24-7 Product Cost Markup Percentage



Apex Corporation produces and sells Product Z at a total cost of \$30 per unit, of which \$20 is product cost and \$10 is selling and administrative expenses. In addition, the total cost of \$30 is made up of \$18 variable cost and \$12 fixed cost. The desired profit is \$3 per unit. Determine the markup percentage on product cost.

## Follow My Example 24-7

Markup percentage on product cost:  $\frac{\$3 + \$10}{\$13} = 65\%$ 

Practice Exercises: PE 24-7A, PE 24-7B

## Integrity, Objectivity, and Ethics in Business



#### **PRICE FIXING**

Federal law prevents companies competing in similar markets from sharing cost and price information, or what is commonly termed "price fixing." For example, the Federal Trade Commission (FTC) brought a suit against U-Haul for releasing company-wide memorandums to its managers

telling them to encourage competitors to match U-Haul price increases. Commenting on the case, the chairman of the FTC stated, "It's a bedrock principle that you can't conspire with your competitors to fix prices, and shouldn't even try."

Source: Edward Wyatt, "U-Haul to Settle with Trade Agency in Case on Truck Rental Price-Fixing," The New York Times, June 10, 2010, p. B3.

## **Target Costing**

Target costing is a method of setting prices that combines market-based pricing with a cost-reduction emphasis. Under target costing, a future selling price is anticipated, using the demand-based or the competition-based concepts. The target cost is then determined by subtracting a desired profit from the expected selling price, computed as follows:

Target Cost = Expected Selling Price - Desired Profit

Target costing tries to reduce costs as shown in Exhibit 10. The bar at the left in Exhibit 10 shows the actual cost and profit that can be earned during the current period. The bar at the right shows that the market price is expected to decline in the future. The target cost is estimated as the difference between the expected market price and the desired profit.

The target cost is normally less than the current cost. Thus, managers must try to reduce costs from the design and manufacture of the product. The planned cost reduction is sometimes referred to as the cost drift. Costs can be reduced in a variety of ways such as the following:

- · Simplifying the design
- · Reducing the cost of direct materials
- · Reducing the direct labor costs
- Eliminating waste

Target costing is especially useful in highly competitive markets such as the market for personal computers. Such markets require continual product cost reductions to remain competitive.



## **EXHIBIT 10**

**Target Cost Concept** 

## **Production Bottlenecks**

A **production bottleneck** (or *constraint*) is a point in the manufacturing process where the demand for the company's product exceeds the ability to produce the product. The **theory of constraints (TOC)** is a manufacturing strategy that focuses on reducing the influence of bottlenecks on production processes.

When a company has a production bottleneck in its production process, it should attempt to maximize its profits, subject to the production bottleneck. In doing so, the unit contribution margin of each product per production bottleneck constraint is used.

To illustrate, assume that PrideCraft Tool Company makes three types of wrenches: small, medium, and large. All three products are processed through a heat treatment operation, which hardens the steel tools. PrideCraft Tool's heat treatment process is

Compute the relative profitability of products in bottleneck production processes.

operating at full capacity and is a production bottleneck. The product unit contribution margin and the number of hours of heat treatment used by each type of wrench are as follows:

	Small Wrench	Medium Wrench	Large Wrench
Unit selling price	\$130	\$140	\$160
Unit variable cost	40	40	40
Unit contribution margin	\$ 90	\$100	\$120
Heat treatment hours per unit	1 hr.	4 hrs.	8 hrs.

The large wrench appears to be the most profitable product because its unit contribution margin of \$120 is the greatest. However, the unit contribution margin can be misleading in a production bottleneck operation.

In a production bottleneck operation, the best measure of profitability is the unit contribution margin per production bottleneck constraint. For PrideCraft Tool, the production bottleneck constraint is heat treatment process hours. Therefore, the unit contribution margin per bottleneck constraint is expressed as follows:

Unit Contribution Margin per Production Bottleneck Hour = 
$$\frac{\text{Unit Contribution Margin}}{\text{Heat Treatment Hours per Unit}}$$

The unit contribution per production bottleneck hour for each of the wrenches produced by PrideCraft Tool is computed as follows:

Small Wrenches

Unit Contribution Margin per Production Bottleneck Hour = 
$$\frac{$90}{1 \text{ hr.}}$$
 = \$90 per hr.

Medium Wrenches

Unit Contribution Margin per Production Bottleneck Hour = 
$$\frac{$100}{4 \text{ hrs.}}$$
 = \$25 per hr.

Large Wrenches

Unit Contribution Margin per Production Bottleneck Hour = 
$$\frac{$120}{8 \text{ hrs.}}$$
 = \$15 per hr.

The small wrench produces the highest unit contribution margin per production bottleneck hour (heat treatment) of \$90 per hour. In contrast, the large wrench has the largest contribution margin per unit of \$120 but has the smallest unit contribution margin per production bottleneck hour of \$15 per hour. Thus, the small wrench is the most profitable product per production bottleneck hour and is the one that should be emphasized in the market.

## Example Exercise 24-8 Bottleneck Profit



Product A has a unit contribution margin of \$15. Product B has a unit contribution margin of \$20. Product A requires three furnace hours, while Product B requires five furnace hours. Determine the most profitable product, assuming the furnace is a constraint.

## Follow My Example 24-8

	Product A	Product B
Unit contribution margin	\$15	\$20
Furnace hours per unit	<u>÷ 3</u>	<u>÷ 5</u>
Unit contribution margin per production bottleneck hour	\$ 5	\$ 4

Product A is the most profitable in using bottleneck resources.

Practice Exercises: PE 24-8A, PE 24-8B

## A P P E N D I X

# **Total and Variable Cost Concepts to Setting Normal Price**

Recall from the chapter that cost-plus methods determine the normal selling price by estimating a cost amount per unit and adding a markup, as follows:

Normal Selling Price = Cost Amount per Unit + Markup

Management determines the markup based on the desired profit for the product. The markup should be sufficient to earn the desired profit plus cover any cost and expenses that are not included in the cost amount. The product cost concept was discussed in the chapter, and the total and variable cost concepts are discussed in this appendix.

## **Total Cost Concept**

As shown in Exhibit 11, under the **total cost concept**, manufacturing cost plus the selling and administrative expenses are included in the total cost per unit. The markup per unit is then computed and added to the total cost per unit to determine the normal selling price.



**EXHIBIT 11** 

**Total Cost Concept** 

The total cost concept is applied using the following steps:

• Step 1. Estimate the total manufacturing cost as follows:

Manufacturing costs:

Direct materials \$XXX

Direct labor XXX

Factory overhead XXX

Total manufacturing cost \$XXX

- Step 2. Estimate the total selling and administrative expenses.
- Step 3. Estimate the total cost as follows:

Total manufacturing costs	\$XXX
Selling and administrative expenses	XXX
Total cost	\$XXX
Total cost	\$X

• Step 4. Divide the total cost by the number of units expected to be produced and sold to determine the total cost per unit, as follows:

• Step 5. Compute the markup percentage as follows:

$$Markup Percentage = \frac{Desired Profit}{Total Cost}$$

The desired profit is normally computed based on a rate of return on assets as follows:

Desired Profit = Desired Rate of Return × Total Assets

• Step 6. Determine the markup per unit by multiplying the markup percentage times the total cost per unit as follows:

Markup per Unit = Markup Percentage × Total Cost per Unit

• Step 7. Determine the normal selling price by adding the markup per unit to the total cost per unit as follows:

Total cost per unit	\$XXX
Markup per unit	XXX
Normal selling price per unit	\$XXX

To illustrate, assume the following data for 100,000 calculators that Digital Solutions Inc. expects to produce and sell during 2016:

Manufacturing costs:		
Direct materials ( $$3.00 \times 100,000$ )		\$ 300,000
Direct labor (\$10.00 × 100,000)		1,000,000
Factory overhead:		
Variable costs ( $$1.50 \times 100,000$ )	\$150,000	
Fixed costs	50,000	200,000
Total manufacturing cost		\$1,500,000
Selling and administrative expenses:		
Variable expenses (\$1.50 × 100,000)	\$150,000	
Variable expenses ( $$1.50 \times 100,000$ ) Fixed costs	\$150,000 	
	,	170,000
Fixed costs	,	170,000 \$1,670,000
Fixed costs Total selling and administrative expenses	,	

Using the total cost concept, the normal selling price of \$18.30 is determined as follows:

- Step 1. Total manufacturing cost: \$1,500,000
- Step 2. Total selling and administrative expenses: \$170,000
- Step 3. Total cost: \$1,670,000
- Step 4. Total cost per unit: \$16.70

$$Total \ Cost \ per \ Unit = \frac{Total \ Cost}{Estimated \ Units \ Produced \ and \ Sold} = \frac{\$1,670,000}{100,000 \ units} = \$16.70 \ per \ unit$$

• Step 5. Markup percentage: 9.6% (rounded)

Desired Profit = Desired Rate of Return  $\times$  Total Assets = 20%  $\times$  \$800,000 = \$160,000

Markup Percentage = 
$$\frac{\text{Desired Profit}}{\text{Total Cost}} = \frac{\$160,000}{\$1,670,000} = 9.6\% \text{ (rounded)}$$

• Step 6. Markup per unit: \$1.60

Markup per Unit = Markup Percentage  $\times$  Total Cost per Unit =  $9.6\% \times \$16.70 = \$1.60$  per unit

• Step 7. Normal selling price: \$18.30

Total cost per unit	\$16.70
Markup per unit	1.60
Normal selling price per unit	\$18.30

The ability of the selling price of \$18.30 to generate the desired profit of \$160,000 is illustrated by the income statement that follows:

#### Digital Solutions Inc. Income Statement For the Year Ended December 31, 2016

Sales (100,000 units × \$18.30)		\$1,830,000
Expenses:		
Variable (100,000 units × \$16.00)	\$1,600,000	
Fixed (\$50,000 + \$20,000)	70,000	1,670,000
Income from operations		\$ 160,000

The total cost concept is often used by contractors who sell products to government agencies. This is because in many cases government contractors are required by law to be reimbursed for their products on a total-cost-plus-profit basis.

## **Variable Cost Concept**

As shown in Exhibit 12, under the variable cost concept, only variable costs are included in the cost amount per unit to which the markup is added. All variable



**EXHIBIT 12** 

Variable Cost Concept manufacturing costs, as well as variable selling and administrative expenses, are included in the cost amount. Fixed manufacturing costs, fixed selling and administrative expenses, and desired profit are included in the markup. The markup per unit is then added to the variable cost per unit to determine the normal selling price.

The variable cost concept is applied using the following steps:

• Step 1. Estimate the total variable product cost as follows:

Variable product costs:

Direct materials	\$XXX
Direct labor	XXX
Variable factory overhead	XXX
Total variable product cost	\$XXX

- Step 2. Estimate the total variable selling and administrative expenses.
- Step 3. Determine the total variable cost as follows:

Total variable product cost	\$XXX
Total variable selling and administrative expenses	XXX
Total variable cost	\$XXX

• Step 4. Compute the variable cost per unit as follows:

$$Variable \ Cost \ per \ Unit = \frac{Total \ Variable \ Cost}{Estimated \ Units \ Produced \ and \ Sold}$$

• Step 5. Compute the markup percentage as follows:

$$\label{eq:markup} \text{Markup Percentage} = \frac{\text{Desired Profit} + \text{Total Fixed Costs and Expenses}}{\text{Total Variable Cost}}$$

The numerator of the markup percentage is the desired profit plus the total fixed costs (fixed factory overhead) and expenses (selling and administrative). These fixed costs and expenses must be included in the markup percentage because they are not included in the cost amount to which the markup is added.

As illustrated for the total and product cost concepts, the desired profit is normally computed based on a rate of return on assets as follows:

Desired Profit = Desired Rate of Return × Total Assets

• Step 6. Determine the markup per unit by multiplying the markup percentage times the variable cost per unit as follows:

Markup per Unit = Markup Percentage × Variable Cost per Unit

 Step 7. Determine the normal selling price by adding the markup per unit to the variable cost per unit as follows:

Variable cost per unit	\$XXX
Markup per unit	XXX
Normal selling price per unit	\$XXX

To illustrate, assume the same data for the production and sale of 100,000 calculators by Digital Solutions Inc. as in the preceding example. The normal selling price of \$18.30 is determined under the variable cost concept as follows:

• Step 1. Total variable product cost: \$1,450,000

Variable product costs:

inable product costs.	
Direct materials ( $$3 \times 100,000$ )	\$ 300,000
Direct labor (\$10 × 100,000)	1,000,000
Variable factory overhead ( $$1.50 \times 100,000$ )	150,000
Total variable product cost	\$1,450,000

- Step 2. Total variable selling and administrative expenses: \$150,000 (\$1.50 × 100,000)
- Step 3. Total variable cost: \$1,600,000 (\$1,450,000 + \$150,000)
- Step 4. Variable cost per unit: \$16.00

Variable Cost per Unit =  $\frac{\text{Total Variable Cost}}{\text{Estimated Units Produced and Sold}} = \frac{\$1,600,000}{100,000 \text{ units}} = \$16 \text{ per unit}$ 

• Step 5. Markup percentage: 14.4% (rounded)

Desired Profit = Desired Rate of Return × Total Assets = 20% × \$800,000 = \$160,000

Markup Percentage = 
$$\frac{\text{Desired Profit + Total Fixed Costs and Expenses}}{\text{Total Variable Cost}}$$
$$= \frac{\$160,000 + \$50,000 + \$20,000}{\$1,600,000} = \frac{\$230,000}{\$1,600,000}$$
$$= 14.4\% \text{ (rounded)}$$

• Step 6. Markup per unit: \$2.30

Markup per Unit = Markup Percentage  $\times$  Variable Cost per Unit =  $14.4\% \times \$16.00 = \$2.30$  per unit

• Step 7. Normal selling price: \$18.30

Total variable cost per unit \$16.00

Markup per unit 2.30

Normal selling price per unit \$18.30

# At a Glance 24



#### Prepare differential analysis reports for a variety of managerial decisions.

**Key Points** Differential analysis reports for various decisions are illustrated in the text. Each analysis focuses on the differential effects on income (loss) for alternative courses of action.

Learning Outcomes	Example Exercises	Practice Exercises
• Prepare a lease or sell differential analysis.	EE24-1	PE24-1A, 24-1B
• Prepare a discontinued segment differential analysis.	EE24-2	PE24-2A, 24-2B
Prepare a make-or-buy differential analysis.	EE24-3	PE24-3A, 24-3B
• Prepare an equipment replacement differential analysis.	EE24-4	PE24-4A, 24-4B
• Prepare a process-or-sell differential analysis.	EE24-5	PE24-5A, 24-5B
• Prepare an accept business at a special price differential analysis.	EE24-6	PE24-6A, 24-6B



#### Determine the selling price of a product, using the product cost concept.

**Key Points** The three cost concepts commonly used in applying the cost-plus approach to product pricing are the product cost, total cost (appendix), and variable cost (appendix) concepts.

Target costing combines market-based methods with a cost-reduction emphasis.

#### **Learning Outcomes**

- Compute the markup percentage, using the product cost concept.
- · Define and describe target costing.

Exam	ple
Exerci	ses
<b>EE2</b> 4	Ĺ-7

Practice Exercises

PE24-7A, 24-7B



#### Compute the relative profitability of products in bottleneck production processes.

**Key Points** The relative profitability of a product in a bottleneck production environment is determined by dividing the unit contribution margin by the bottleneck hours per unit.

#### **Learning Outcome**

• Compute the unit contribution margin per bottleneck hour.

Example
Exercises
EE24-8

Practice Exercises

PE24-8A, 24-8B

## **Key Terms**

differential analysis (1119) differential cost (1119) differential income (loss) (1119) differential revenue (1119) opportunity cost (1125) product cost concept (1130) production bottleneck (1133) sunk cost (1121)

target costing (1132) theory of constraints (TOC) (1133) total cost concept (1135) variable cost concept (1137)

## **Illustrative Problem**

Inez Company recently began production of a new product, a digital clock, which required the investment of \$1,600,000 in assets. The costs of producing and selling 80,000 units of the digital clock are estimated as follows:

#### Variable costs:

Direct materials \$10.00 per unit

Direct labor 6.00

Factory overhead 4.00

Selling and administrative expenses 5.00

Total \$25.00 per unit

Fixed costs:

Factory overhead \$800,000 Selling and administrative expenses 400,000 Inez Company is currently considering establishing a selling price for the digital clock. The president of Inez Company has decided to use the cost-plus approach to product pricing and has indicated that the digital clock must earn a 10% rate of return on invested assets.

#### **Instructions**

- 1. Determine the amount of desired profit from the production and sale of the digital clock.
- 2. Assuming that the product cost concept is used, determine (a) the cost amount per unit, (b) the markup percentage, and (c) the selling price of the digital clock.
- 3. Under what conditions should Inez Company consider using activity-based costing rather than a single factory overhead allocation rate in allocating factory overhead to the digital clock?
- 4. Assume the market price for similar digital clocks was estimated at \$38. Compute the reduction in manufacturing cost per unit needed to maintain the desired profit and existing selling and administrative expenses under target costing.
- 5. Assume that for the current year, the selling price of the digital clock was \$42 per unit. To date, 60,000 units have been produced and sold, and analysis of the domestic market indicates that 15,000 additional units are expected to be sold during the remainder of the year. On August 7 Inez Company received an offer from Wong Inc. for 4,000 units of the digital clock at \$28 each. Wong Inc. will market the units in Korea under its own brand name, and no selling and administrative expenses associated with the sale will be incurred by Inez Company. The additional business is not expected to affect the domestic sales of the digital clock, and the additional units could be produced during the current year, using existing capacity. Prepare a differential analysis dated August 7 to determine whether to reject (Alternative 1) or accept (Alternative 2) the special order from Wong.

#### Solution

- 1.  $$160,000 ($1,600,000 \times 10\%)$
- 2. a. Total manufacturing costs:

 $\begin{array}{lll} \text{Variable ($20 \times 80,000 \ units)} & \$1,600,000 \\ \text{Fixed factory overhead} & \underline{800,000} \\ \text{Total} & \$2,400,000 \end{array}$ 

Cost amount per unit:  $$2,400,000 \div 80,000 \text{ units} = $30.00$ 

b. Markup Percentage = 
$$\frac{\frac{\text{Desired}}{\text{Profit}} + \text{Administrative Expenses}}{\text{Total Product Cost}}$$

$$= \frac{\frac{\$160,000 + \$400,000 + (\$5 \times 80,000 \text{ units})}{\$2,400,000}$$

$$= \frac{\$160,000 + \$400,000 + \$400,000}{\$2,400,000}$$

$$= \frac{\$960,000}{\$2,400,000} = 40\%$$
c. Cost amount per unit \$30.00

- Markup (\$30 × 40%) 12.00
  Selling price \$42.00
- 3. Inez should consider using activity-based costing for factory overhead allocation when the product and manufacturing operations are complex. For example, if the digital clock was introduced as one among many different consumer digital products, then it is likely these products will consume factory activities in different ways. If this is combined with complex manufacturing and manufacturing support processes, then

it is likely a single overhead allocation rate will lead to distorted factory overhead allocation. Specifically, the digital clock is a new product. Thus, it is likely that it will consume more factory overhead than existing stable and mature products. In this case, a single rate would result in the digital clock being undercosted compared to results using activity-based rates for factory overhead allocation.

4. Current selling price	\$42
Expected selling price	-38
Required reduction in manufacturing cost to maintain same profit	\$ 4

Revised revenue and cost figures:

	Current	Desired
Selling price	\$42	\$38
Costs:		
Variable selling and administrative expenses per unit	\$ 5	\$ 5
Fixed selling and administrative expenses per unit		
(\$400,000 ÷ 80,000 units)	5	5
Existing manufacturing cost per unit [part (2)]	30	
Target manufacturing cost per unit (\$30 – \$4)	_	26
Total costs	\$40	\$36
Profit	\$ 2	\$ 2

# Differential Analysis—Wong Inc. Special Order Reject Order (Alternative 1) or Accept Order (Alternative 2) August 7

	Reject Order (Alternative 1)	Accept Order (Alternative 2)	Differential Effect on Income (Alternative 2)
Revenues	\$0	\$112,000*	\$112,000
Costs:			
Variable manufacturing costs	_0	-80,000**	-80,000
Income (loss)	<u>\$0</u>	\$ 32,000	\$ 32,000
*4,000 units × \$28 per unit			
**4,000 units × \$20 per unit			

The proposal should be accepted.

## **Discussion Questions**

- 1. Explain the meaning of (a) differential revenue, (b) differential cost, and (c) differential income.
- 2. A company could sell a building for \$250,000 or lease it for \$2,500 per month. What would need to be considered in determining if the lease option would be preferred?
- 3. A chemical company has a commodity-grade and premium-grade product. Why might the company elect to process the commodity-grade product further to the premium-grade product?
- 4. A company accepts incremental business at a special price that exceeds the variable cost. What other

- issues must the company consider in deciding whether to accept the business?
- 5. A company fabricates a component at a cost of \$6.00. A supplier offers to supply the same component for \$5.50. Under what circumstances is it reasonable to purchase from the supplier?
- 6. Many fast-food restaurant chains, such as McDonald's, will occasionally discontinue restaurants in their system. What are some financial considerations in deciding to eliminate a store?
- 7. In the long run, the normal selling price must be set high enough to cover what factors?

- 8. Although the cost-plus approach to product pricing may be used by management as a general guide-line, what are some examples of other factors that managers should also consider in setting product prices?
- 9. How does the target cost concept differ from costplus approaches?
- 10. What is the appropriate measure of a product's value when a firm is operating under production bottlenecks?

## **Practice Exercises**

#### **EE 24-1** p. 1121

#### PE 24-1A Lease or sell

**OBJ. 1** 



Claxon Company owns a machine with a cost of \$305,000 and accumulated depreciation of \$65,000 that can be sold for \$262,000, less a 5% sales commission. Alternatively, the machine can be leased by Claxon Company for three years for a total of \$272,000, at the end of which there is no residual value. In addition, the repair, insurance, and property tax expense that would be incurred by Claxon Company on the machine would total \$21,600 over the three years. Prepare a differential analysis on January 12 as to whether Claxon Company should lease (Alternative 1) or sell (Alternative 2) the machine.

#### **EE 24-1** p. 1121

#### PE 24-1B Lease or sell

OBJ.



Timberlake Company owns equipment with a cost of \$165,000 and accumulated depreciation of \$60,000 that can be sold for \$82,000, less a 6% sales commission. Alternatively, the equipment can be leased by Timberlake Company for five years for a total of \$84,600, at the end of which there is no residual value. In addition, the repair, insurance, and property tax expense that would be incurred by Timberlake Company on the equipment would total \$7,950 over the five years. Prepare a differential analysis on March 23 as to whether Timberlake Company should lease (Alternative 1) or sell (Alternative 2) the equipment.

#### **EE 24-2** *p. 1123*

#### PE 24-2A Discontinue a segment

OBJ. 1



Product TS-20 has revenue of \$102,000, variable cost of goods sold of \$52,500, variable selling expenses of \$21,500, and fixed costs of \$35,000, creating a loss from operations of \$7,000. Prepare a differential analysis as of September 12 to determine if Product TS-20 should be continued (Alternative 1) or discontinued (Alternative 2), assuming fixed costs are unaffected by the decision.

#### **EE 24-2** *p. 1123*

#### PE 24-2B Discontinue a segment

OBJ. 1



Product B has revenue of \$39,500, variable cost of goods sold of \$25,500, variable selling expenses of \$16,500, and fixed costs of \$15,000, creating a loss from operations of \$17,500. Prepare a differential analysis as of May 9 to determine if Product B should be continued (Alternative 1) or discontinued (Alternative 2), assuming fixed costs are unaffected by the decision.

#### **EE 24-3** p. 1124

#### PE 24-3A Make or buy

OBJ. 1



A restaurant bakes its own bread for a cost of \$165 per unit (100 loaves), including fixed costs of \$43 per unit. A proposal is offered to purchase bread from an outside source for \$110 per unit, plus \$15 per unit for delivery. Prepare a differential analysis dated August 16 to determine whether the company should make (Alternative 1) or buy (Alternative 2) the bread, assuming fixed costs are unaffected by the decision.

#### **EE 24-3** p. 1124

#### PE 24-3B Make or buy

OBJ, 1



A company manufactures various sized plastic bottles for its medicinal product. The manufacturing cost for small bottles is \$67 per unit (100 bottles), including fixed costs of \$22 per unit. A proposal is offered to purchase small bottles from an outside source for \$35 per unit, plus \$5 per unit for freight. Prepare a differential analysis dated March 30 to determine whether the company should make (Alternative 1) or buy (Alternative 2) the bottles, assuming fixed costs are unaffected by the decision.

#### **EE 24-4** p. 1126

#### PE 24-4A Replace equipment

OBJ. 1



A machine with a book value of \$126,000 has an estimated six-year life. A proposal is offered to sell the old machine for \$84,000 and replace it with a new machine at a cost of \$145,000. The new machine has a six-year life with no residual value. The new machine would reduce annual direct labor costs from \$55,000 to \$43,000. Prepare a differential analysis dated February 18 on whether to continue with the old machine (Alternative 1) or replace the old machine (Alternative 2).

#### **EE 24-4** p. 1126

#### PE 24-4B Replace equipment

OBJ. 1



A machine with a book value of \$80,000 has an estimated five-year life. A proposal is offered to sell the old machine for \$50,500 and replace it with a new machine at a cost of \$75,000. The new machine has a five-year life with no residual value. The new machine would reduce annual direct labor costs from \$11,200 to \$7,400. Prepare a differential analysis dated April 11 on whether to continue with the old machine (Alternative 1) or replace the old machine (Alternative 2).

#### **EE 24-5** p. 1127

#### PE 24-5A Process or sell

OBJ. 1



Product T is produced for \$5.90 per pound. Product T can be sold without additional processing for \$7.10 per pound, or processed further into Product U at an additional cost of \$0.74 per pound. Product U can be sold for \$8.00 per pound. Prepare a differential analysis dated August 2 on whether to sell Product T (Alternative 1) or process further into Product U (Alternative 2).

#### **EE 24-5** p. 1127

#### PE 24-5B Process or sell

OBJ. 1



Product D is produced for \$24 per gallon. Product D can be sold without additional processing for \$36 per gallon, or processed further into Product E at an additional cost of \$9 per gallon. Product E can be sold for \$43 per gallon. Prepare a differential analysis dated February 26 on whether to sell Product D (Alternative 1) or process further into Product E (Alternative 2).

#### **EE 24-6** p. 1129

#### PE 24-6A Accept business at special price

OBJ. 1



Product R is normally sold for \$52 per unit. A special price of \$42 is offered for the export market. The variable production cost is \$30 per unit. An additional export tariff of 30% of revenue must be paid for all export products. Assume there is sufficient capacity for the special order. Prepare a differential analysis dated October 23 on whether to reject (Alternative 1) or accept (Alternative 2) the special order.

#### **EE 24-6** p. 1129

#### PE 24-6B Accept business at special price

OBJ. 1



Product A is normally sold for \$9.60 per unit. A special price of \$7.20 is offered for the export market. The variable production cost is \$5.00 per unit. An additional export tariff of 15% of revenue must be paid for all export products. Assume there is sufficient capacity for the special order. Prepare a differential analysis dated March 16 on whether to reject (Alternative 1) or accept (Alternative 2) the special order.

#### **EE 24-7** p. 1132

#### PE 24-7A Product cost markup percentage

OBJ. 2



Magna Lighting Inc. produces and sells lighting fixtures. An entry light has a total cost of \$125 per unit, of which \$80 is product cost and \$45 is selling and administrative expenses. In addition, the total cost of \$125 is made up of \$90 variable cost and \$35 fixed cost. The desired profit is \$55 per unit. Determine the markup percentage on product cost.

#### **EE 24-7** *p. 1132*

#### PE 24-7B Product cost markup percentage

ORI 2



Green Thumb Garden Tools Inc. produces and sells home and garden tools and equipment. A lawnmower has a total cost of \$230 per unit, of which \$160 is product cost and \$70 is selling and administrative expenses. In addition, the total cost of \$230 is made up of \$120 variable cost and \$110 fixed cost. The desired profit is \$58 per unit. Determine the markup percentage on product cost.

#### **EE 24-8** p. 1134

#### PE 24-8A Bottleneck profit

OBJ. 3



Product A has a unit contribution margin of \$24. Product B has a unit contribution margin of \$30. Product A requires four testing hours, while Product B requires six testing hours. Determine the most profitable product, assuming the testing is a bottleneck constraint.

#### **EE 24-8** p. 1134

#### PE 24-8B Bottleneck profit

OBJ. 3



Product K has a unit contribution margin of \$120. Product L has a unit contribution margin of \$100. Product K requires five furnace hours, while Product L requires four furnace hours. Determine the most profitable product, assuming the furnace is a bottleneck constraint.

#### Exercises

#### EX 24-1 Differential analysis for a lease or sell decision

OBJ. 1

✓ a. Differential revenue from selling, \$5,000

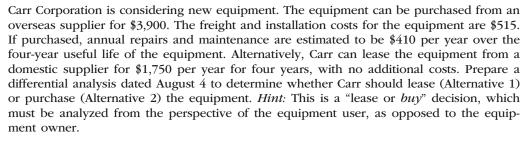


Eclipse Construction Company is considering selling excess machinery with a book value of \$280,000 (original cost of \$400,000 less accumulated depreciation of \$120,000) for \$221,000, less a 5% brokerage commission. Alternatively, the machinery can be leased for a total of \$216,000 for five years, after which it is expected to have no residual value. During the period of the lease, Eclipse Construction Company's costs of repairs, insurance, and property tax expenses are expected to be \$14,200.

- a. Prepare a differential analysis, dated April 16 to determine whether Eclipse should lease (Alternative 1) or sell (Alternative 2) the machinery.
- b. On the basis of the data presented, would it be advisable to lease or sell the machinery? Explain.

#### EX 24-2 Differential analysis for a lease or buy decision

OBJ. 1



## SHOW ME HOW

✓ a. Differential revenues, -\$390,000



#### EX 24-3 Differential analysis for a discontinued product

OBJ. 1

A condensed income statement by product line for Celestial Beverage Inc. indicated the following for Star Cola for the past year:

(Continued)

Sales	\$390,000
Cost of goods sold	184,000
Gross profit	\$206,000
Operating expenses	255,000
Loss from operations	\$ (49,000)

It is estimated that 20% of the cost of goods sold represents fixed factory overhead costs and that 30% of the operating expenses are fixed. Because Star Cola is only one of many products, the fixed costs will not be materially affected if the product is discontinued.

- a. Prepare a differential analysis, dated January 21 to determine whether Star Cola should be continued (Alternative 1) or discontinued (Alternative 2).
- b. Should Star Cola be retained? Explain.

#### EX 24-4 Differential analysis for a discontinued product

OBJ, 1

The condensed product-line income statement for Dish N' Dat Company for the month of March is as follows:

#### Dish N' Dat Company Product-Line Income Statement For the Month Ended March 31, 2016

	Bowls	Plates	Cups
Sales	\$71,000	\$105,700	\$31,300
Cost of goods sold	32,600	42,300	16,800
Gross profit	\$38,400	\$ 63,400	\$14,500
Selling and administrative expenses	27,400	42,800	16,700
Income from operations	\$11,000	\$ 20,600	\$ (2,200)

Fixed costs are 15% of the cost of goods sold and 40% of the selling and administrative expenses. Dish N' Dat assumes that fixed costs would not be materially affected if the Cups line were discontinued.

- a. Prepare a differential analysis dated March 31, 2016, to determine if Cups should be continued (Alternative 1) or discontinued (Alternative 2).
- b. Should the Cups line be retained? Explain.

#### **EX 24-5** Segment analysis for a service company

OBJ. 1

Charles Schwab Corporation is one of the more innovative brokerage and financial service companies in the United States. The company recently provided information about its major business segments as follows (in millions):

	Investor Services	Institutional Services
Revenues	\$3,228	\$1,583
Income from operations	865	514
Depreciation	148	48

- a. How does a brokerage company like Schwab define the "Investor Services" and "Institutional Services" segments? Use the Internet to develop your answer.
- b. Provide a specific example of a variable and fixed cost in the "Investor Services" segment.
- Estimate the contribution margin for each segment, assuming depreciation represents the majority of fixed costs.
- d. If Schwab decided to sell its "Institutional Services" accounts to another company, estimate how much operating income would decline.

✓ a. Alternative 1 loss, \$2,200





#### EX 24-6 Decision to discontinue a product

OBJ. 1

On the basis of the following data, the general manager of Featherweight Shoes Inc. decided to discontinue Children's Shoes because it reduced income from operations by \$17,000. What is the flaw in this decision, if it is assumed fixed costs would not be materially affected by the discontinuance?

Featherweight Shoes Inc. Product-Line Income Statement For the Year Ended April 30, 2016

	Children's Shoes	Men's Shoes	Women's Shoes	Total
Sales	\$235,000	\$300,000	\$500,000	\$1,035,000
Costs of goods sold:		·		
Variable costs	\$130,000	\$150,000	\$220,000	\$ 500,000
Fixed costs	41,000	60,000	120,000	221,000
Total cost of goods sold	\$171,000	\$210,000	\$340,000	\$ 721,000
Gross profit	\$ 64,000	\$ 90,000	\$160,000	\$ 314,000
Selling and adminstrative expenses:				
Variable selling and admin. expenses	\$ 46,000	\$ 45,000	\$ 95,000	\$ 186,000
Fixed selling and admin. expenses	35,000	20,000	25,000	80,000
Total selling and admin. expenses	\$ 81,000	\$ 65,000	\$120,000	\$ 266,000
Income (loss) from operations	\$ (17,000)	\$ 25,000	\$ 40,000	\$ 48,000

#### EX 24-7 Make-or-buy decision

0BJ. 1

Jupiter Computer Company has been purchasing carrying cases for its portable computers at a purchase price of \$70 per unit. The company, which is currently operating below full capacity, charges factory overhead to production at the rate of 40% of direct labor cost. The fully absorbed unit costs to produce comparable carrying cases are expected to be as follows:

Direct materials	\$45
Direct labor	20
Factory overhead (40% of direct labor)	8
Total cost per unit	\$73

If Jupiter Computer Company manufactures the carrying cases, fixed factory overhead costs will not increase and variable factory overhead costs associated with the cases are expected to be 15% of the direct labor costs.

- a. Prepare a differential analysis, dated July 19 to determine whether the company should make (Alternative 1) or buy (Alternative 2) the carrying case.
- b. On the basis of the data presented, would it be advisable to make the carrying cases or to continue buying them? Explain.

#### EX 24-8 Make-or-buy decision for a service company

OBJ. 1

The Theater Arts Guild of Dallas (TAG-D) employs five people in its Publication Department. These people lay out pages for pamphlets, brochures, magazines, and other publications for the TAG-D productions. The pages are delivered to an outside company for printing. The company is considering an outside publication service for the layout work. The outside service is quoting a price of \$13 per layout page. The budget for the Publication Department for the current year is as follows:

Salaries	\$224,000
Benefits	36,000
Supplies	21,000
Office expenses	39,000
Office depreciation	28,000
Computer depreciation	24,000
Total	\$372,000

(Continued)

✓ a. Differential loss from buying, \$2.00 per case







The department expects to lay out 24,000 pages for the current year. The Publication Department office space and equipment would be used for future administrative needs, if the department's function were purchased from the outside.

- a. Prepare a differential analysis dated February 22 to determine whether TAG-D should lay out pages internally (Alternative 1) or purchase layout services from the outside (Alternative 2).
- b. On the basis of your analysis in part (a), should the page layout work be purchased from an outside company?
- c. What additional considerations might factor into the decision making?

#### EX 24-9 Machine replacement decision

OBJ, 1

A company is considering replacing an old piece of machinery, which cost \$600,000 and has \$350,000 of accumulated depreciation to date, with a new machine that has a purchase price of \$545,000. The old machine could be sold for \$231,000. The annual variable production costs associated with the old machine are estimated to be \$61,000 per year for eight years. The annual variable production costs for the new machine are estimated to be \$19,000 per year for eight years.

- a. Prepare a differential analysis dated September 13 to determine whether to continue with (Alternative 1) or replace (Alternative 2) the old machine.
- b. What is the sunk cost in this situation?

#### EX 24-10 Differential analysis for machine replacement

OBJ, 1

Kim Kwon Digital Components Company assembles circuit boards by using a manually operated machine to insert electronic components. The original cost of the machine is \$60,000, the accumulated depreciation is \$24,000, its remaining useful life is five years, and its residual value is negligible. On May 4 of the current year, a proposal was made to replace the present manufacturing procedure with a fully automatic machine that has a purchase price of \$180,000. The automatic machine has an estimated useful life of five years and no significant residual value. For use in evaluating the proposal, the accountant accumulated the following annual data on present and proposed operations:

	Present Operations	Proposed Operations
Sales	\$205,000	\$205,000
Direct materials	\$ 72,000	\$ 72,000
Direct labor	51,000	_
Power and maintenance	5,000	18,000
Taxes, insurance, etc.	1,500	4,000
Selling and administrative expenses	45,000	45,000
Total expenses	\$174,500	\$139,000

- a. Prepare a differential analysis dated May 4 to determine whether to continue with the old machine (Alternative 1) or replace the old machine (Alternative 2). Prepare the analysis over the useful life of the new machine.
- b. Based only on the data presented, should the proposal be accepted?
- c. What are some of the other factors that should be considered before a final decision is made?

#### EX 24-11 Sell or process further

OBJ. 1

Portland Lumber Company incurs a cost of \$452 per hundred board feet (hbf) in processing certain "rough-cut" lumber, which it sells for \$611 per hbf. An alternative is to produce a "finished cut" at a total processing cost of \$559 per hbf, which can be sold for \$748 per hbf. Prepare a differential analysis dated June 14 on whether to sell rough-cut lumber (Alternative 1) or process further into finished-cut lumber (Alternative 2).



✓ a. Differential loss, \$2,500







✓ a. Differential

income, \$54,000

#### EX 24-12 Sell or process further

OBJ. 1

Rise N' Shine Coffee Company produces Columbian coffee in batches of 6,000 pounds. The standard quantity of materials required in the process is 6,000 pounds, which cost \$5.50 per pound. Columbian coffee can be sold without further processing for \$9.22 per pound. Columbian coffee can also be processed further to yield Decaf Columbian, which can be sold for \$11.88 per pound. The processing into Decaf Columbian requires additional processing costs of \$10,230 per batch. The additional processing will also cause a 5% loss of product due to evaporation.

- a. Prepare a differential analysis dated October 6 on whether to sell regular Columbian (Alternative 1) or process further into Decaf Columbian (Alternative 2).
- b. Should Rise N' Shine sell Columbian coffee or process further and sell Decaf Columbian?
- c. Determine the price of Decaf Columbian that would cause neither an advantage nor a disadvantage for processing further and selling Decaf Columbian.

#### EX 24-13 Decision on accepting additional business

OBJ. 1

Homestead Jeans Co. has an annual plant capacity of 65,000 units, and current production is 45,000 units. Monthly fixed costs are \$54,000, and variable costs are \$29 per unit. The present selling price is \$42 per unit. On November 12 of the current year, the company received an offer from Dawkins Company for 18,000 units of the product at \$32 each. Dawkins Company will market the units in a foreign country under its own brand name. The additional business is not expected to affect the domestic selling price or quantity of sales of Homestead Jeans Co.

- a. Prepare a differential analysis dated November 12 on whether to reject (Alternative 1) or accept (Alternative 2) the Dawkins order.
- b. Briefly explain the reason why accepting this additional business will increase operating income.
- c. What is the minimum price per unit that would produce a positive contribution margin?

#### EX 24-14 Accepting business at a special price

OBJ. 1

Portable Power Company expects to operate at 80% of productive capacity during July. The total manufacturing costs for July for the production of 25,000 batteries are budgeted as follows:

Direct materials	\$162,500
Direct labor	70,000
Variable factory overhead	30,000
Fixed factory overhead	112,500
Total manufacturing costs	\$375,000

The company has an opportunity to submit a bid for 2,500 batteries to be delivered by July 31 to a government agency. If the contract is obtained, it is anticipated that the additional activity will not interfere with normal production during July or increase the selling or administrative expenses. What is the unit cost below which Portable Power Company should not go in bidding on the government contract?

✓ a. Differential revenue, \$2,320,000





#### EX 24-15 Decision on accepting additional business

OBJ. 1

Brightstone Tire and Rubber Company has capacity to produce 170,000 tires. Brightstone presently produces and sells 130,000 tires for the North American market at a price of \$175 per tire. Brightstone is evaluating a special order from a European automobile company, Euro Motors. Euro is offering to buy 20,000 tires for \$116 per tire. Brightstone's accounting system indicates that the total cost per tire is as follows:

(Continued)

Brightstone pays a selling commission equal to 5% of the selling price on North American orders, which is included in the variable portion of the selling and administrative expenses. However, this special order would not have a sales commission. If the order was accepted, the tires would be shipped overseas for an additional shipping cost of \$7.50 per tire. In addition, Euro has made the order conditional on receiving European safety certification. Brightstone estimates that this certification would cost \$165,000.

- a. Prepare a differential analysis dated January 21 on whether to reject (Alternative 1) or accept (Alternative 2) the special order from Euro Motors.
- b. What is the minimum price per unit that would be financially acceptable to Brightstone?

#### **EX 24-16** Accepting business at a special price for a service company

Cityscape Hotels has 200 rooms available in a major metropolitan city. The hotel is able to attract business customers during the weekdays, and leisure customers during the weekend. However, the leisure customers on weekends occupy fewer rooms than do business customers on weekdays. Thus, Cityscape plans to provide special weekend pricing to attract additional leisure customers. A hotel room is priced at \$180 per room night. The cost of a hotel room night includes the following:

	Cost Per Room Night (at normal occupancy)
Housekeeping service	\$ 23
Utilities	7
Amenities	3
Hotel depreciation	55
Hotel staff (excluding housekeeping)	42
Total	\$130

- a. What is the contribution margin for a room night if only the hotel depreciation and hotel staff are assumed fixed for all occupancy levels?
- b. What should be considered in setting a discount price for the weekends?

#### EX 24-17 Product cost concept of product pricing

OBJ. 2

La Femme Accessories Inc. produces women's handbags. The cost of producing 800 handbags is as follows:

Direct materials	\$18,000
Direct labor	8,500
Factory overhead	5,500
Total manufacturing cost	\$32,000

The selling and administrative expenses are \$17,000. The management desires a profit equal to 22% of invested assets of \$250,000.

- a. Determine the amount of desired profit from the production and sale of 800 handbags.
- b. Determine the product cost per unit for the production of 800 handbags.
- c. Determine the product cost markup percentage for handbags.
- d. Determine the selling price of handbags.



**✓** b. \$40



#### EX 24-18 Product cost concept of product costing

OBJ. 2

✓ d. \$325

Smart Stream Inc. uses the product cost concept of applying the cost-plus approach to product pricing. The costs of producing and selling 10,000 cellular phones are as follows:

Variable costs per unit:		Fixed costs:	
Direct materials	\$150	Factory overhead	\$350,000
Direct labor	25	Selling and admin. exp.	140,000
Factory overhead	40		
Selling and administrative			
expenses	25		
Total	\$240		

Smart Stream desires a profit equal to a 30% rate of return on invested assets of \$1,200,000.

- Determine the amount of desired profit from the production and sale of 10,000 cellular phones.
- Determine the product cost and the cost amount per unit for the production of 10,000 cellular phones.
- c. Determine the product cost markup percentage for cellular phones.
- d. Determine the selling price of cellular phones.

#### EX 24-19 Target costing

OBJ. 2

**Toyota Motor Corporation** uses target costing. Assume that Toyota marketing personnel estimate that the competitive selling price for the Camry in the upcoming model year will need to be \$27,000. Assume further that the Camry's total unit cost for the upcoming model year is estimated to be \$22,500 and that Toyota requires a 20% profit margin on selling price (which is equivalent to a 25% markup on total cost).

- a. What price will Toyota establish for the Camry for the upcoming model year?
- b. What impact will target costing have on Toyota, given the assumed information?

#### EX 24-20 Target costing

OBJ. 2

Instant Image Inc. manufactures color laser printers. Model J20 presently sells for \$460 and has a product cost of \$230, as follows:

Direct materials	\$175
Direct labor	40
Factory overhead	15
Total	\$230

It is estimated that the competitive selling price for color laser printers of this type will drop to \$400 next year. Instant Image has established a target cost to maintain its historical markup percentage on product cost. Engineers have provided the following cost reduction ideas:

- 1. Purchase a plastic printer cover with snap-on assembly, rather than with screws. This will reduce the amount of direct labor by 15 minutes per unit.
- 2. Add an inspection step that will add six minutes per unit of direct labor but reduce the materials cost by \$20 per unit.
- 3. Decrease the cycle time of the injection molding machine from four minutes to three minutes per part. Forty percent of the direct labor and 48% of the factory overhead are related to running injection molding machines.

The direct labor rate is \$30 per hour.

- a. Determine the target cost for Model J20, assuming that the historical markup on product cost and selling price is maintained.
- b. Determine the required cost reduction.
- c. Evaluate the three engineering improvements together to determine if the required cost reduction (drift) can be achieved.



**✓** b. \$30

#### EX 24-21 Product decisions under bottlenecked operations

OBJ. 3

Mill Metals Inc. has three grades of metal product, Type 5, Type 10, and Type 20. Financial data for the three grades are as follows:

	Type 5	Type 10	Type 20
Revenues	\$43,000	\$49,000	\$56,500
Variable cost	\$34,000	\$28,000	\$26,500
Fixed cost	8,000	8,000	8,000
Total cost	\$42,000	\$36,000	\$34,500
Income from operations	\$ 1,000	\$13,000	\$22,000
Number of units	÷ 5,000	÷ 5,000	÷ 5,000
Income from operations per unit	\$ 0.20	\$ 2.60	\$ 4.40

Mill's operations require all three grades to be melted in a furnace before being formed. The furnace runs 24 hours a day, 7 days a week, and is a production bottleneck. The furnace hours required per unit of each product are as follows:

Type 5:	6 hours
Type 10:	6 hours
Type 20:	12 hours

The Marketing Department is considering a new marketing and sales campaign.

Which product should be emphasized in the marketing and sales campaign in order to maximize profitability?

#### EX 24-22 Product decisions under bottlenecked operations

OBJ. 3

Youngstown Glass Company manufactures three types of safety plate glass: large, medium, and small. All three products have high demand. Thus, Youngstown Glass is able to sell all the safety glass that it can make. The production process includes an autoclave operation, which is a pressurized heat treatment. The autoclave is a production bottleneck. Total fixed costs are \$85,000 for the company as a whole. In addition, the following information is available about the three products:

	Large	Medium	Small
Unit selling price	\$184	\$160	\$100
Unit variable cost	130	120	76
Unit contribution margin	\$ 54	\$ 40	\$ 24
Autoclave hours per unit	3	2	1
Total process hours per unit	5	4	2
Budgeted units of production	3,000	3,000	3,000

- a. Determine the contribution margin by glass type and the total company income from operations for the budgeted units of production.
- b. Prepare an analysis showing which product is the most profitable per bottleneck hour.

#### **Appendix**

#### EX 24-23 Total cost concept of product pricing

**✓** b. 12.46%

✓ a. Total income

from operations,

\$269,000

Based on the data presented in Exercise 24-18, assume that Smart Stream Inc. uses the total cost concept of applying the cost-plus approach to product pricing.

- a. Determine the total costs and the total cost amount per unit for the production and sale of 10,000 cellular phones.
- b. Determine the total cost markup percentage (rounded to two decimal places) for cellular phones.
- c. Determine the selling price of cellular phones. Round to the nearest dollar.

#### **Appendix**

#### EX 24-24 Variable cost concept of product pricing

✓ b. 35.42%

Based on the data presented in Exercise 24-18, assume that Smart Stream Inc. uses the variable cost concept of applying the cost-plus approach to product pricing.

- a. Determine the variable costs and the variable cost amount per unit for the production and sale of 10,000 cellular phones.
- Determine the variable cost markup percentage (rounded to two decimal places) for cellular phones.
- c. Determine the selling price of cellular phones. Round to the nearest dollar.

## **Problems: Series A**

## X

#### PR 24-1A Differential analysis involving opportunity costs

OBJ. 1

On October 1, White Way Stores Inc. is considering leasing a building and purchasing the necessary equipment to operate a retail store. Alternatively, the company could use the funds to invest in \$180,000 of 6% U.S. Treasury bonds that mature in 16 years. The bonds could be purchased at face value. The following data have been assembled:

Cost of store equipment	\$180,000
Life of store equipment	16 years
Estimated residual value of store equipment	\$15,000
Yearly costs to operate the store, excluding	
depreciation of store equipment	\$58,000
Yearly expected revenues—years 1–8	\$85,000
Yearly expected revenues—years 9–16	\$73,000

#### **Instructions**

- 1. Prepare a differential analysis as of October 1 presenting the proposed operation of the store for the 16 years (Alternative 1) as compared with investing in U.S. Treasury bonds (Alternative 2).
- 2. Based on the results disclosed by the differential analysis, should the proposal be accepted?
- 3. If the proposal is accepted, what would be the total estimated income from operations of the store for the 16 years?



#### PR 24-2A Differential analysis for machine replacement proposal

OBJ. 1

Lexigraphic Printing Company is considering replacing a machine that has been used in its factory for four years. Relevant data associated with the operations of the old machine and the new machine, neither of which has any estimated residual value, are as follows:

Old Machine			
Cost of machine, 10-year life	\$89,000		
Annual depreciation (straight-line)	8,900		
Annual manufacturing costs, excluding depreciation	23,600		
Annual nonmanufacturing operating expenses	6,100		
Annual revenue	74,200		
Current estimated selling price of machine	29,700		
New Machine			
Purchase price of machine, six-year life	\$119,700		
Annual depreciation (straight-line)	19,950		
Estimated annual manufacturing costs, excluding depreciation	6,900		

Annual nonmanufacturing operating expenses and revenue are not expected to be affected by purchase of the new machine.

(Continued)

#### **Instructions**

- 1. Prepare a differential analysis as of April 30 comparing operations using the present machine (Alternative 1) with operations using the new machine (Alternative 2). The analysis should indicate the total differential income that would result over the six-year period if the new machine is acquired.
- 2. List other factors that should be considered before a final decision is reached.

#### PR 24-3A Differential analysis for sales promotion proposal

OBJ, 1

Parisian Cosmetics Company is planning a one-month campaign for September to promote sales of one of its two cosmetics products. A total of \$140,000 has been budgeted for advertising, contests, redeemable coupons, and other promotional activities. The following data have been assembled for their possible usefulness in deciding which of the products to select for the campaign:

	Moisturizer	Perfume
Unit selling price	\$55	\$60
Unit production costs:		
Direct materials	\$ 9	\$14
Direct labor	3	5
Variable factory overhead	3	5
Fixed factory overhead	6	4
Total unit production costs	\$21	\$28
Unit variable selling expenses	16	15
Unit fixed selling expenses	_12	6
Total unit costs	\$49	\$49
Operating income per unit	\$ 6	\$11

No increase in facilities would be necessary to produce and sell the increased output. It is anticipated that 22,000 additional units of moisturizer or 20,000 additional units of perfume could be sold from the campaign without changing the unit selling price of either product.

#### **Instructions**

- 1. Prepare a differential analysis as of August 21 to determine whether to promote moisturizer (Alternative 1) or perfume (Alternative 2).
- 2. The sales manager had tentatively decided to promote perfume, estimating that operating income would be increased by \$80,000 (\$11 operating income per unit for 20,000 units, less promotion expenses of \$140,000). The manager also believed that the selection of moisturizer would reduce operating income by \$8,000 (\$6 operating income per unit for 22,000 units, less promotion expenses of \$140,000). State briefly your reasons for supporting or opposing the tentative decision.

#### PR 24-4A Differential analysis for further processing

OBJ. 1

The management of Dominican Sugar Company is considering whether to process further raw sugar into refined sugar. Refined sugar can be sold for \$2.20 per pound, and raw sugar can be sold without further processing for \$1.40 per pound. Raw sugar is produced in batches of 42,000 pounds by processing 100,000 pounds of sugar cane, which costs \$0.35 per pound of cane. Refined sugar will require additional processing costs of \$0.50 per pound of raw sugar, and 1.25 pounds of raw sugar will produce 1 pound of refined sugar.

#### **Instructions**

- 1. Prepare a differential analysis as of March 24 to determine whether to sell raw sugar (Alternative 1) or process further into refined sugar (Alternative 2).
- 2. Briefly report your recommendations.

✓ 1. Differential revenue, -\$10,000





✓ 1. Raw sugar income, \$23,800

#### **Appendix**

### PR 24-5A Product pricing using the cost-plus approach concepts; differential analysis for accepting additional business

OBJ. 1, 2

✓ 2. b. Markup percentage, 44%

Crystal Displays Inc. recently began production of a new product, flat panel displays, which required the investment of \$1,500,000 in assets. The costs of producing and selling 5,000 units of flat panel displays are estimated as follows:

Variable costs per unit:		Fixed costs:	
Direct materials	\$120	Factory overhead	\$250,000
Direct labor	30	Selling and administrative expenses	150,000
Factory overhead	50		
Selling and administrative expenses	35		
Total	\$235		

Crystal Displays Inc. is currently considering establishing a selling price for flat panel displays. The president of Crystal Displays has decided to use the cost-plus approach to product pricing and has indicated that the displays must earn a 15% rate of return on invested assets.

#### Instructions

- 1. Determine the amount of desired profit from the production and sale of flat panel displays.
- 2. Assuming that the product cost concept is used, determine (a) the cost amount per unit, (b) the markup percentage, and (c) the selling price of flat panel displays.
- 3. (*Appendix*) Assuming that the total cost concept is used, determine (a) the cost amount per unit, (b) the markup percentage (rounded to two decimal places), and (c) the selling price of flat panel displays (rounded to nearest whole dollar).
- 4. (*Appendix*) Assuming that the variable cost concept is used, determine (a) the cost amount per unit, (b) the markup percentage (rounded to two decimal places), and (c) the selling price of flat panel displays (rounded to nearest whole dollar).
- 5. Comment on any additional considerations that could influence establishing the selling price for flat panel displays.
- 6. Assume that as of August 1, 3,000 units of flat panel displays have been produced and sold during the current year. Analysis of the domestic market indicates that 2,000 additional units are expected to be sold during the remainder of the year at the normal product price determined under the product cost concept. On August 3, Crystal Displays Inc. received an offer from Maple Leaf Visual Inc. for 800 units of flat panel displays at \$225 each. Maple Leaf Visual Inc. will market the units in Canada under its own brand name, and no variable selling and administrative expenses associated with the sale will be incurred by Crystal Displays Inc. The additional business is not expected to affect the domestic sales of flat panel displays, and the additional units could be produced using existing factory, selling, and administrative capacity.
  - a. Prepare a differential analysis of the proposed sale to Maple Leaf Visual Inc.
  - b. Based on the differential analysis in part (a), should the proposal be accepted?

#### PR 24-6A Product pricing and profit analysis with bottleneck operations

OBJ. 3

Hercules Steel Company produces three grades of steel: high, good, and regular grade. Each of these products (grades) has high demand in the market, and Hercules is able to sell as much as it can produce of all three. The furnace operation is a bottleneck in the process and is running at 100% of capacity. Hercules wants to improve steel operation profitability. The variable conversion cost is \$15 per process hour. The fixed cost is \$200,000. In addition, the cost analyst was able to determine the following information about the three products:

	High Grade	<b>Good Grade</b>	Regular Grade
Budgeted units produced	5,000	5,000	5,000
Total process hours per unit	12	11	10
Furnace hours per unit	4	3	2.5
Unit selling price	\$280	\$270	\$250
Direct materials cost per unit	\$90	\$84	\$80

(Continued)

✓ 1. High Grade, \$10



The furnace operation is part of the total process for each of these three products. Thus, for example, 4.0 of the 12.0 hours required to process High Grade steel are associated with the furnace.

#### **Instructions**

- 1. Determine the unit contribution margin for each product.
- 2. Provide an analysis to determine the relative product profitability, assuming that the furnace is a bottleneck.

### **Problems: Series B**



#### PR 24-1B Differential analysis involving opportunity costs

OBJ. 1

On July 1, Coastal Distribution Company is considering leasing a building and buying the necessary equipment to operate a public warehouse. Alternatively, the company could use the funds to invest in \$740,000 of 5% U.S. Treasury bonds that mature in 14 years. The bonds could be purchased at face value. The following data have been assembled:

Cost of equipment	\$740,000
Life of equipment	14 years
Estimated residual value of equipment	\$75,000
Yearly costs to operate the warehouse, excluding	
depreciation of equipment	\$175,000
Yearly expected revenues—years 1–7	\$280,000
Yearly expected revenues—years 8–14	\$240,000

#### **Instructions**

- 1. Prepare a differential analysis as of July 1 presenting the proposed operation of the warehouse for the 14 years (Alternative 1) as compared with investing in U.S. Treasury bonds (Alternative 2).
- 2. Based on the results disclosed by the differential analysis, should the proposal be accepted?
- 3. If the proposal is accepted, what is the total estimated income from operations of the warehouse for the 14 years?



#### PR 24-2B Differential analysis for machine replacement proposal

OBJ. 1

Flint Tooling Company is considering replacing a machine that has been used in its factory for two years. Relevant data associated with the operations of the old machine and the new machine, neither of which has any estimated residual value, are as follows:

Old Machine	
Cost of machine, eight-year life	\$38,000
Annual depreciation (straight-line)	4,750
Annual manufacturing costs, excluding depreciation	12,400
Annual nonmanufacturing operating expenses	2,700
Annual revenue	32,400
Current estimated selling price of the machine	12,900
New Machine	
Cost of machine, six-year life	\$57,000
Annual depreciation (straight-line)	9,500
Estimated annual manufacturing costs, exclusive of depreciation	3,400

Annual nonmanufacturing operating expenses and revenue are not expected to be affected by purchase of the new machine.

T------

#### **Instructions**

- 1. Prepare a differential analysis as of November 8 comparing operations using the present machine (Alternative 1) with operations using the new machine (Alternative 2). The analysis should indicate the differential income that would result over the six-year period if the new machine is acquired.
- 2. List other factors that should be considered before a final decision is reached.

#### PR 24-3B Differential analysis for sales promotion proposal

OBJ, 1

Sole Mates Inc. is planning a one-month campaign for July to promote sales of one of its two shoe products. A total of \$100,000 has been budgeted for advertising, contests, redeemable coupons, and other promotional activities. The following data have been assembled for their possible usefulness in deciding which of the products to select for the campaign:

	Tennis Shoe	Walking Shoe
Unit selling price	\$85	\$100
Unit production costs:		
Direct materials	\$19	\$ 32
Direct labor	8	12
Variable factory overhead	7	5
Fixed factory overhead	_16	11
Total unit production costs	\$50	\$ 60
Unit variable selling expenses	6	10
Unit fixed selling expenses	_20	15
Total unit costs	\$76	\$ 85
Operating income per unit	<u>\$ 9</u>	\$ 15

No increase in facilities would be necessary to produce and sell the increased output. It is anticipated that 7,000 additional units of tennis shoes or 7,000 additional units of walking shoes could be sold without changing the unit selling price of either product.

#### **Instructions**

- 1. Prepare a differential analysis as of June 19 to determine whether to promote tennis shoes (Alternative 1) or walking shoes (Alternative 2).
- 2. The sales manager had tentatively decided to promote walking shoes, estimating that operating income would be increased by \$5,000 (\$15 operating income per unit for 7,000 units, less promotion expenses of \$100,000). The manager also believed that the selection of tennis shoes would reduce operating income by \$37,000 (\$9 operating income per unit for 7,000 units, less promotion expenses of \$100,000). State briefly your reasons for supporting or opposing the tentative decision.

#### PR 24-4B Differential analysis for further processing

OBJ. 1

The management of International Aluminum Co. is considering whether to process aluminum ingot further into rolled aluminum. Rolled aluminum can be sold for \$2,200 per ton, and ingot can be sold without further processing for \$1,100 per ton. Ingot is produced in batches of 80 tons by smelting 500 tons of bauxite, which costs \$105 per ton of bauxite. Rolled aluminum will require additional processing costs of \$620 per ton of ingot, and 1.25 tons of ingot will produce 1 ton of rolled aluminum (due to trim losses).

#### Instructions

- 1. Prepare a differential analysis as of February 5 to determine whether to sell aluminum ingot (Alternative 1) or process further into rolled aluminum (Alternative 2).
- 2. Briefly report your recommendations.

✓ 1. Differential revenue, \$105,000





✓ 1. Ingot income, \$35,500

#### Appendix

### PR 24-5B Product pricing using the cost-plus approach concepts; differential analysis for accepting additional business

**OBJ. 1, 2** 

✓ 2. b. Markup percentage, 30%

Night Glow Inc. recently began production of a new product, the halogen light, which required the investment of \$600,000 in assets. The costs of producing and selling 10,000 halogen lights are estimated as follows:

Variable costs per unit:		Fixed costs:	
Direct materials	\$32	Factory overhead	\$180,000
Direct labor	12	Selling and administrative expenses	80,000
Factory overhead	8		
Selling and administrative expenses	7		
Total	\$59		

Night Glow Inc. is currently considering establishing a selling price for the halogen light. The president of Night Glow Inc. has decided to use the cost-plus approach to product pricing and has indicated that the halogen light must earn a 10% rate of return on invested assets.

#### **Instructions**

- 1. Determine the amount of desired profit from the production and sale of the halogen light.
- 2. Assuming that the product cost concept is used, determine (a) the cost amount per unit, (b) the markup percentage, and (c) the selling price of the halogen light.
- 3. (*Appendix*) Assuming that the total cost concept is used, determine (a) the cost amount per unit, (b) the markup percentage (rounded to two decimal places), and (c) the selling price of the halogen light (rounded to the nearest whole dollar).
- 4. (*Appendix*) Assuming that the variable cost concept is used, determine (a) the cost amount per unit, (b) the markup percentage (rounded to two decimal places), and (c) the selling price of the halogen light (rounded to nearest whole dollar).
- 5. Comment on any additional considerations that could influence establishing the selling price for the halogen light.
- 6. Assume that as of September 1, 7,000 units of halogen light have been produced and sold during the current year. Analysis of the domestic market indicates that 3,000 additional units of the halogen light are expected to be sold during the remainder of the year at the normal product price determined under the product cost concept. On September 5, Night Glow Inc. received an offer from Tokyo Lighting Inc. for 1,600 units of the halogen light at \$57 each. Tokyo Lighting Inc. will market the units in Japan under its own brand name, and no variable selling and administrative expenses associated with the sale will be incurred by Night Glow Inc. The additional business is not expected to affect the domestic sales of the halogen light, and the additional units could be produced using existing productive, selling, and administrative capacity.
  - a. Prepare a differential analysis of the proposed sale to Tokyo Lighting Inc.
  - b. Based on the differential analysis in part (a), should the proposal be accepted?

#### PR 24-6B Product pricing and profit analysis with bottleneck operations

OBJ. 3

Wilmington Chemical Company produces three products: ethylene, butane, and ester. Each of these products has high demand in the market, and Wilmington Chemical is able to sell as much as it can produce of all three. The reaction operation is a bottleneck in the process and is running at 100% of capacity. Wilmington wants to improve chemical operation profitability. The variable conversion cost is \$10 per process hour. The fixed cost is \$400,000. In addition, the cost analyst was able to determine the following information about the three products:

✓ 1. Ethylene, \$15

	Ethylene	Butane	Ester
Budgeted units produced	9,000	9,000	9,000
Total process hours per unit	4.0	4.0	3.0
Reactor hours per unit	1.5	1.0	0.5
Unit selling price	\$170	\$155	\$130
Direct materials cost per unit	\$115	\$88	\$85

The reaction operation is part of the total process for each of these three products. Thus, for example, 1.5 of the 4.0 hours required to process ethylene is associated with the reactor.

#### **Instructions**

- 1. Determine the unit contribution margin for each product.
- 2. Provide an analysis to determine the relative product profitabilities, assuming that the reactor is a bottleneck.

### **Cases & Projects**



#### CP 24-1 Ethics and professional conduct in business

Aaron McKinney is a cost accountant for Majik Systems Inc. Martin Dodd, vice president of marketing, has asked Aaron to meet with representatives of Majik Systems' major competitor to discuss product cost data. Martin indicates that the sharing of these data will enable Majik Systems to determine a fair and equitable price for its products.

Would it be ethical for Aaron to attend the meeting and share the relevant cost data?

#### CP 24-2 Decision on accepting additional business

A manager of Varden Sporting Goods Company is considering accepting an order from an overseas customer. This customer has requested an order for 20,000 dozen golf balls at a price of \$22 per dozen. The variable cost to manufacture a dozen golf balls is \$18 per dozen. The full cost is \$25 per dozen. Varden has a normal selling price of \$35 per dozen. Varden's plant has just enough excess capacity on the second shift to make the overseas order.









#### CP 24-3 Accept business at a special price for a service company

If you are not familiar with Priceline.com Inc., go to its Web site. Assume that an individual "names a price" of \$85 on Priceline.com for a room in Nashville, Tennessee, on August 22. Assume that August 22 is a Saturday, with low expected room demand in Nashville at a Marriott International, Inc., hotel, so there is excess room capacity. The fully allocated cost per room per day is assumed from hotel records as follows:

Housekeeping labor cost*	\$ 38
Hotel depreciation expense	43
Cost of room supplies (soap, paper, etc.)	8
Laundry labor and material cost*	10
Cost of desk staff	6
Utility cost (mostly air conditioning)	5
Total cost per room per day	\$110

^{*}Both housekeeping and laundry staff include many part-time workers, so that the workload is variable to demand.

Should Marriott accept the customer bid for a night in Nashville on August 22 at a price of \$85?

#### CP 24-4 Cost-plus and target costing concepts

The following conversation took place between Juanita Jackson, vice president of marketing, and Les Miles, controller of Diamond Computer Company:

Juanita: I am really excited about our new computer coming out. I think it will be a real market success.

Les: I'm really glad you think so. I know that our success will be determined by our price. If our price is too high, our competitors will be the ones with the market success.

Juanita: Don't worry about it. We'll just mark our product cost up by 25%, and it will all work out. I know we'll make money at those markups. By the way, what does the estimated product cost look like?

Les: Well, there's the rub. The product cost looks as if it's going to come in at around \$1,200. With a 25% markup, that will give us a selling price of \$1,500.

Juanita: I see your concern. That's a little high. Our research indicates that computer prices are dropping and that this type of computer should be selling for around \$1,250 when we release it to the market.

Les: I'm not sure what to do.

Juanita: Let me see if I can help. How much of the \$1,200 is fixed cost?

Les: About \$200.

Juanita: There you go. The fixed cost is sunk. We don't need to consider it in our pricing decision. If we reduce the product cost by \$200, the new price with a 25% markup would be right at \$1,250. Boy, I was really worried for a minute there. I knew something wasn't right.

- a. _____If you were Les, how would you respond to Juanita's solution to the pricing problem?
- b. How might target costing be used to help solve this pricing dilemma?

#### CP 24-5 Pricing decisions and markup on variable costs

#### **Group Project**

Many businesses are offering their products and services over the Internet. Some of these companies and their Internet addresses follow:

Company Name	Internet Address (URL)	Product
Delta Air Lines	www.delta.com	Airline tickets
Amazon.com	www.amazon.com	Books
Dell Inc.	www.dell.com	Personal computers

- a. In groups of three, assign each person in your group to one of the Internet sites listed. For each site, determine the following:
  - 1. A product (or service) description
  - 2. A product price
  - 3. A list of costs that are required sell the product selected in part (1) as listed in the annual report on SEC Form 10-K



Internet Project



# **Capital Investment Analysis**



## Vail Resorts, Inc.

hy are you paying tuition, studying this text, and spending time and money on a higher education? Most people believe that the money and time spent now will return them more earnings in the future. That is, the cost of higher education is an investment in your future earning ability. How would you know if this investment is worth it?

One method would be for you to compare the cost of a higher education against the estimated increase in your future earning power. The bigger the difference between your expected future earnings and the cost of your education, the better the investment. A business also evaluates its investments in fixed assets by comparing the initial cost of the investment to its future earnings and cash flows.

For example, **Vail Resorts, Inc.**, is one of the largest ski resort owner operators in the

world. They are known for their Vail, Breckenridge, and Keystone ski resorts, among others. A ski resort requires significant investments in property and equipment. Thus, Vail routinely makes major investments in new or improved amenities, lodging, retail, lifts, snowmaking and grooming equipment, and technology infrastructure. These investments are evaluated by their ability to enhance cash flows.

In this chapter, the methods used to make investment decisions, which may involve thousands, millions, or even billions of dollars, are described and illustrated. The similarities and differences among the most commonly used methods of evaluating investment proposals, as well as the benefits of each method, are emphasized. Factors that can complicate the analysis are also discussed.

	Learning Objectives	
After st	udying this chapter, you should be able to:	Example Exercises
OBJ 1	Explain the nature and importance of capital investment analysis.  Nature of Capital Investment Analysis	
2	Evaluate capital investment proposals, using the average rate of return and cash payback methods.  Methods Not Using Present Values  Average Rate of Return Method  Cash Payback Method	EE 25-1 EE 25-2
3	Evaluate capital investment proposals, using the net present value and internal rate of return methods.  Methods Using Present Values Present Value Concepts Net Present Value Method and Index Net Present Value Method Present Value Index Internal Rate of Return Method	EE 25-3 EE 25-4
(a)	List and describe factors that complicate capital investment analysis. Factors That Complicate Capital Investment Analysis Income Tax Unequal Proposal Lives Lease Versus Capital Investment Uncertainty Changes in Price Levels Qualitative Considerations	EE 25-5
OBJ 5	Diagram the capital rationing process. Capital Rationing	
		At a Glance 25 Page 1179

Explain the nature and importance of capital investment analysis.

The Walt Disney

Company and its partners will commit more than \$4.4 billion to build Shanghai Disneyland, which is scheduled to open in 2016.

### **Nature of Capital Investment Analysis**

Companies use capital investment analysis to evaluate long-term investments. **Capital investment analysis** (or *capital budgeting*) is the process by which management plans, evaluates, and controls investments in fixed assets. Capital investments use funds and affect operations for many years and must earn a reasonable rate of return. Thus, capital investment decisions are some of the most important decisions that management makes.

Capital investment evaluation methods can be grouped into the following categories:

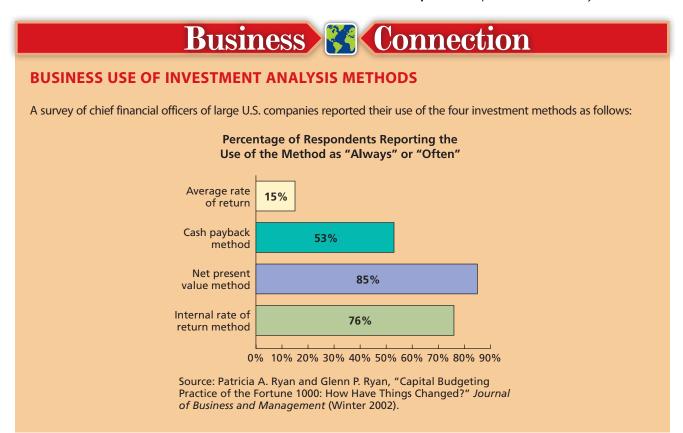
#### Methods That Do Not Use Present Values

- Average rate of return method
- Cash payback method

#### **Methods That Use Present Values**

- Net present value method
- Internal rate of return method

The two methods that use present values consider the time value of money. The time value of money concept recognizes that a dollar today is worth more than a dollar tomorrow because today's dollar can earn interest.



### **Methods Not Using Present Values**

The methods not using present values are often useful in evaluating capital investment proposals that have relatively short useful lives. In such cases, the timing of the cash flows (the time value of money) is less important.

Because the methods not using present values are easy to use, they are often used to screen proposals. Minimum standards for accepting proposals are set, and proposals not meeting these standards are dropped. If a proposal meets the minimum standards, it may be subject to further analysis using the present value methods.

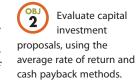
### **Average Rate of Return Method**

The average rate of return, sometimes called the accounting rate of return, measures the average income as a percent of the average investment. The average rate of return is computed as follows:

$$\mbox{Average Rate of Return} = \frac{\mbox{Estimated Average Annual Income}}{\mbox{Average Investment}}$$

In the preceding equation, the numerator is the average of the annual income expected to be earned from the investment over its life, after deducting depreciation. The denominator is the average investment (book value) over the life of the investment. Assuming straight-line depreciation, the average investment is computed as follows:

Average Investment = 
$$\frac{\text{Initial Cost} + \text{Residual Value}}{2}$$



To illustrate, assume that management is evaluating the purchase of a new machine as follows:

Cost of new machine	\$500,000
Residual value	0
Estimated total income from machine	200,000
Expected useful life	4 years

The average estimated annual income from the machine is  $$50,000 ($200,000 \div 4)$  years). The average investment is \$250,000, computed as follows:

Average Investment = 
$$\frac{\text{Initial Cost} + \text{Residual Value}}{2} = \frac{\$500,000 + \$0}{2} = \$250,000$$

The average rate of return on the average investment is 20%, computed as follows:

Average Rate of Return = 
$$\frac{\text{Estimated Average Annual Income}}{\text{Average Investment}} = \frac{\$50,000}{\$250,000} = 20\%$$

The average rate of return of 20% should be compared to the minimum rate of return required by management. If the average rate of return equals or exceeds the minimum rate, the machine should be purchased or considered for further analysis.

Several capital investment proposals can be ranked by their average rates of return. The higher the average rate of return, the more desirable the proposal.

The average rate of return has the following three advantages:

- It is easy to compute.
- It includes the entire amount of income earned over the life of the proposal.
- It emphasizes accounting income, which is often used by investors and creditors in evaluating management performance.

The average rate of return has the following two disadvantages:

- It does not directly consider the expected cash flows from the proposal.
- It does not directly consider the timing of the expected cash flows.

### Example Exercise 25-1 Average Rate of Return

OBJ 2

Determine the average rate of return for a project that is estimated to yield total income of \$273,600 over three years, has a cost of \$690,000, and has a \$70,000 residual value.

#### Follow My Example 25-1

Note:

The average rate of return

amount of income earned over the life of a proposal.

method considers the

Estimated average annual income \$91,200 (\$273,600  $\div$  3 years) Average investment \$380,000 (\$690,000 + \$70,000)  $\div$  2 Average rate of return 24% (\$91,200  $\div$  \$380,000)

Practice Exercises: PE 25-1A, PE 25-1B

### **Cash Payback Method**

A capital investment uses cash and must return cash in the future to be successful. The expected period of time between the date of an investment and the recovery in cash of the amount invested is the **cash payback period**.

When annual net cash inflows are equal, the cash payback period is computed as follows:

Cash Payback Period = 
$$\frac{\text{Initial Cost}}{\text{Annual Net Cash Inflow}}$$

To illustrate, assume that management is evaluating the purchase of the following new machine:

Cost of new machine	\$200,000
Cash revenues from machine per year	50,000
Expenses of machine per year	30,000
Depreciation per year	20,000

To simplify, the revenues and expenses other than depreciation are assumed to be in cash. Hence, the net cash inflow per year from use of the machine is as follows:

Net cash inflow per year:		
Cash revenues from machine		\$50,000
Less cash expenses of machine:		
Expenses of machine	\$30,000	
Less depreciation	20,000	10,000
Net cash inflow per year		\$40,000

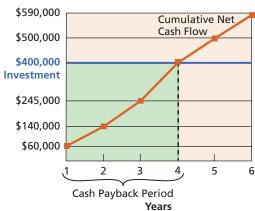
The time required for the net cash flow to equal the cost of the new machine is the payback period. Thus, the estimated cash payback period for the investment is five years, computed as follows:

Cash Payback Period = 
$$\frac{\text{Initial Cost}}{\text{Annual Net Cash Inflow}} = \frac{\$200,000}{\$40,000} = 5 \text{ years}$$

In the preceding illustration, the annual net cash inflows are equal (\$40,000 per year). When the annual net cash inflows are not equal, the cash payback period is determined by adding the annual net cash inflows until the cumulative total equals the initial cost of the proposed investment.

To illustrate, assume that a proposed investment has an initial cost of \$400,000. The annual and cumulative net cash inflows over the proposal's six-year life are as follows:

Year	Net Cash Flow	Cumulative Net Cash Flow
1	\$ 60,000	\$ 60,000
2	80,000	140,000
3	105,000	245,000
4	155,000	400,000
5	100,000	500,000
6	90,000	590,000



The cumulative net cash flow at the end of Year 4 equals the initial cost of the investment, \$400,000. Thus, the payback period is four years.

If the initial cost of the proposed investment had been \$450,000, the cash payback period would occur during Year 5. Because \$100,000 of net cash flow is expected during Year 5, the additional \$50,000 to increase the cumulative total to \$450,000 occurs halfway through the year ( $$50,000 \div $100,000$ ). Thus, the cash payback period would be  $4\frac{1}{2}$  years.

A short cash payback period is desirable. This is because the sooner cash is recovered, the sooner it can be reinvested in other projects. In addition, there is less chance of losses from changing economic or business conditions. A short cash payback period is also desirable for quickly repaying any debt used to purchase the investment.

¹ Unless otherwise stated, net cash inflows are received uniformly throughout the year.

The cash payback method has the following two advantages:

- It is simple to use and understand.
- It analyzes cash flows.

The cash payback method has the following two disadvantages:

- It ignores cash flows occurring after the payback period.
- It does not use present value concepts in valuing cash flows occurring in different periods.

#### Example Exercise 25-2 Cash Payback Period



A project has estimated annual net cash flows of \$30,000. It is estimated to cost \$105,000. Determine the cash payback period.

#### Follow My Example 25-2

 $3.5 \text{ years } (\$105,000 \div \$30,000)$ 

Practice Exercises: PE 25-2A, PE 25-2B



### **Methods Using Present Values**

An investment in fixed assets may be viewed as purchasing a series of net cash flows over a period of time. The timing of when the net cash flows will be received is important in determining the value of a proposed investment.

Present value methods use the amount and timing of the net cash flows in evaluating an investment. The two methods of evaluating capital investments using present values are as follows:

- Net present value method
- Internal rate of return method

### **Present Value Concepts**

Both the net present value and the internal rate of return methods use the following two **present value concepts**:

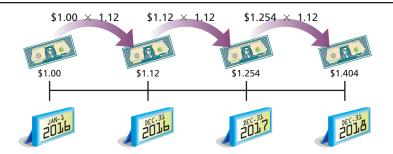
- Present value of an amount
- · Present value of an annuity

**Present Value of an Amount** If you were given the choice, would you prefer to receive \$1 now or \$1 three years from now? You should prefer to receive \$1 now, because you could invest the \$1 and earn interest for three years. As a result, the amount you would have after three years would be greater than \$1.

To illustrate, assume that you have \$1 to invest as follows:

Amount to be invested \$1
Period to be invested 3 years
Interest rate 12%

After one year, the \$1 earns interest of \$0.12 ( $$1 \times 12\%$ ) and, thus, will grow to \$1.12 ( $$1 \times 1.12$ ). In the second year, the \$1.12 earns 12% interest of \$0.134 ( $$1.12 \times 12\%$ ) and, thus, will grow to \$1.254 ( $$1.12 \times 1.12$ ) by the end of the second year. This process of interest earning interest is called *compounding*. By the end of the third year, your \$1 investment will grow to \$1.404 as shown in Exhibit 1.



#### **EXHIBIT 1**

Compound Amount of \$1 for Three Periods at 12%

On January 1, 2016, what is the present value of \$1.404 to be received on December 31, 2018? This is a present value question. The answer can be determined with the aid of a present value of \$1 table. For example, the partial table in Exhibit 2 indicates that the present value of \$1 to be received in three years with earnings compounded at the rate of 12% per year is 0.712.²

Present Value of \$1 at Compound Interest					
Year	6%	10%	12%	15%	20%
1	0.943	0.909	0.893	0.870	0.833
2	0.890	0.826	0.797	0.756	0.694
3	0.840	0.751	0.712	0.658	0.579
4	0.792	0.683	0.636	0.572	0.482
5	0.747	0.621	0.567	0.497	0.402
6	0.705	0.564	0.507	0.432	0.33
7	0.665	0.513	0.452	0.376	0.279
8	0.627	0.467	0.404	0.327	0.233
9	0.592	0.424	0.361	0.284	0.19
10	0.558	0.386	0.322	0.247	0.162

#### **EXHIBIT 2**

Partial Present Value of \$1 Table

Multiplying 0.712 by \$1.404 yields \$1 as follows:

		Present Value of \$1		
Amount to Be		to Be Received in 3 Years		
<b>Present Value</b>	Received in 3 Years	(from Exhibit 2)		
<u></u>	= \$1.404	0.712		

That is, the present value of \$1.404 to be received in three years using a compound interest rate of 12% is \$1, as shown in Exhibit 3.

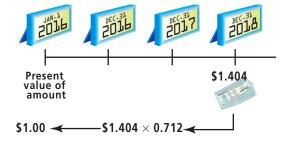


EXHIBIT 3

Present Value of an Amount of \$1.404

**Present Value of an Annuity** An **annuity** is a series of equal net cash flows at fixed time intervals. Annuities are very common in business. Cash payments for monthly rent, salaries, and bond interest are all examples of annuities.

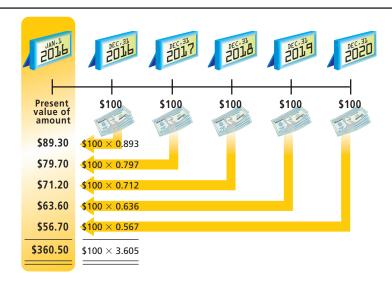
²The present value factors in the table are rounded to three decimal places. More complete tables of present values are in Appendix A.

The **present value of an annuity** is the amount of cash needed today to yield a series of equal net cash flows at fixed time intervals in the future.

To illustrate, the present value of a \$100 annuity for five periods at 12% could be determined by using the present value factors in Exhibit 2. Each \$100 net cash flow could be multiplied by the present value of \$1 at a 12% factor for the appropriate period and summed to determine a present value of \$360.50, as shown in Exhibit 4.

#### **EXHIBIT 4**

Present Value of a \$100 Amount for Five Consecutive Periods



Using a present value of an annuity table is a simpler approach. Exhibit 5 is a partial table of present value annuity factors.³

The present value factors in the table shown in Exhibit 5 are the sum of the present value of \$1 factors in Exhibit 2 for the number of annuity periods. Thus, 3.605 in the annuity table (Exhibit 5) is the sum of the five present value of \$1 factors at 12% from Exhibit 2, computed as follows:

	Present Value of \$1 (Exhibit 2)
Present value of \$1 for 1 year @12%	0.893
Present value of \$1 for 2 years @12%	0.797
Present value of \$1 for 3 years @12%	0.712
Present value of \$1 for 4 years @12%	0.636
Present value of \$1 for 5 years @12%	0.567
Present value of an annuity of \$1 for 5 years (from Exhibit 5)	3.605

Multiplying \$100 by 3.605 yields \$360.50 as follows:

Present Value		Amount to Be Received Annually for 5 Years		Present Value of an Annuity of \$1 to Be Received for 5 Years (Exhibit 5)
\$360.50	=	\$100	×	3.605

Thus, \$360.50 is the same amount that was determined in the preceding illustration by five successive multiplications.

³ The present value factors in the table are rounded to three decimal places. More complete tables of present values are in Appendix A.

Present Value of an Annuity of \$1 at Compound Interest					200/
Year	6%	10%	12%	15%	20%
1	0.943	0.909	0.893	0.870	0.833
2	1.833	1.736	1.690	1.626	1.528
3	2.673	2.487	2.402	2.283	2.106
4	3.465	3.170	3.037	2.855	2.589
5	4.212	3.791	<mark>3.605</mark>	3.353	2.991
6	4.917	4.355	4.111	3.785	3.326
7	5.582	4.868	4.564	4.160	3.605
8	6.210	5.335	4.968	4.487	3.837
9	6.802	5.759	5.328	4.772	4.031
10	7.360	6.145	5.650	5.019	4.192

#### **EXHIBIT 5**

Partial Present Value of an Annuity Table

#### **Net Present Value Method and Index**

The net present value method and present value index are often used in combination, as we illustrate in this section.

#### **Net Present Value Method**

The **net present value method** compares the amount to be invested with the present value of the net cash inflows. It is sometimes called the *discounted cash flow method*.

The interest rate (return) used in net present value analysis is the company's minimum desired rate of return. This rate, sometimes termed the *burdle rate*, is based on such factors as the purpose of the investment and the cost of obtaining funds for the investment. If the present value of the cash inflows equals or exceeds the amount to be invested, the proposal is desirable.

To illustrate, assume the following data for a proposed investment in new equipment:

Cost of new equipment	\$200,000
Expected useful life	5 years
Minimum desired rate of return	10%
Expected cash flows to be received each year:	
Year 1	\$ 70,000
Year 2	60,000
Year 3	50,000
Year 4	40,000
Year 5	40,000
Total expected cash flows	\$260,000

The present value of the net cash flow for each year is computed by multiplying the net cash flow for the year by the present value factor of \$1 for that year, as follows:

Year	Present Value of \$1 at 10%	×	Net Cash Flow	=	Present Value of Net Cash Flow
1	0.909		\$ 70,000		\$ 63,630
2	0.826		60,000		49,560
3	0.751		50,000		37,550
4	0.683		40,000		27,320
5	0.621		40,000		24,840
Total			\$260,000		\$202,900
Less amoui	nt to be invested				200,000
Net presen	t value				\$ 2,900

The preceding computations are also graphically illustrated in Exhibit 6.

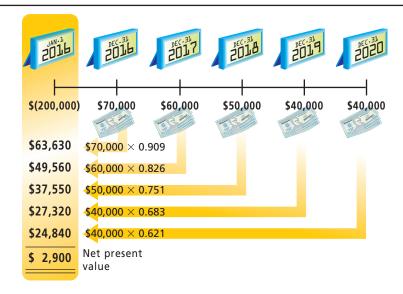
#### Note:

The net present value method compares an investment's initial cash outflow with the present value of its cash inflows.



#### **EXHIBIT 6**

Present Value of Equipment Cash Flows



The net present value of \$2,900 indicates that the purchase of the new equipment is expected to recover the investment and provide more than the minimum rate of return of 10%. Thus, the purchase of the new equipment is desirable.

The net present value method has the following three advantages:

- It considers the cash flows of the investment.
- It considers the time value of money.
- It can rank projects with equal lives, using the present value index.

The net present value method has the following two disadvantages:

- It has more complex computations than methods that don't use present value.
- It assumes the cash flows can be reinvested at the minimum desired rate of return, which may not be valid.

#### **Present Value Index**

When capital investment funds are limited and the proposals involve different investments, a ranking of the proposals can be prepared by using a present value index. The **present value index** is computed as follows:

Present Value Index 
$$=$$
  $\frac{\text{Total Present Value of Net Cash Flow}}{\text{Amount to Be Invested}}$ 

The present value index for the investment in the preceding illustration is 1.0145, computed as follows:

Present Value Index = 
$$\frac{$202,900}{$200,000}$$
 = 1.0145

Assume that a company is considering three proposals. The net present value and the present value index for each proposal are as follows:

	Proposal A	Proposal B	Proposal C
Total present value of net cash flow	\$107,000	\$86,400	\$86,400
Less amount to be invested	100,000	80,000	90,000
Net present value	\$ 7,000	\$ 6,400	\$ (3,600)
Present value index:			
Proposal A (\$107,000 ÷ \$100,000)	1.07		
Proposal B (\$86,400 ÷ \$80,000)		1.08	
Proposal C (\$86,400 ÷ \$90,000)			0.96

A project will have a present value index greater than 1 when the net present value is positive. This is the case for Proposals A and B. When the net present value is negative, the present value index will be less than 1, as is the case for Proposal C.

Although Proposal A has the largest net present value, the present value indices indicate that it is not as desirable as Proposal B. That is, Proposal B returns \$1.08 present value per dollar invested, whereas Proposal A returns only \$1.07. Proposal B requires an investment of \$80,000, compared to an investment of \$100,000 for Proposal A. The possible use of the \$20,000 difference between Proposals A and B investments should also be considered before making a final decision.

### **Example Exercise 25-3** Net Present Value



A project has estimated annual net cash flows of \$50,000 for seven years and is estimated to cost \$240,000. Assume a minimum acceptable rate of return of 12%. Using Exhibit 5, determine (a) the net present value of the project and (b) the present value index, rounded to two decimal places.

#### Follow My Example 25-3

a. (\$11,800)

 $[(\$50,000 \times 4.564) - \$240,000]$ 

b. 0.95

(\$228,200 ÷ \$240,000)

Practice Exercises: PE 25-3A, PE 25-3B

#### **Internal Rate of Return Method**

The **internal rate of return (IRR) method** uses present value concepts to compute the rate of return from a capital investment proposal based on its expected net cash flows. This method, sometimes called the *time-adjusted rate of return method*, starts with the proposal's net cash flows and works backward to estimate the proposal's expected rate of return.

To illustrate, assume that management is evaluating the following proposal to purchase new equipment:

Cost of new equipment	\$33,530
Yearly expected cash flows to be received	\$10,000
Expected life	5 years
Minimum desired rate of return	12%

The present value of the net cash flows, using the present value of an annuity table in Exhibit 5, is \$2,520, as shown in Exhibit 7.

#### **EXHIBIT 7**

Net Present Value Analysis at 12% Annual net cash flow (at the end of each of five years)

Present value of an annuity of \$1 at 12% for five years (Exhibit 5)

Present value of annual net cash flows

Less amount to be invested

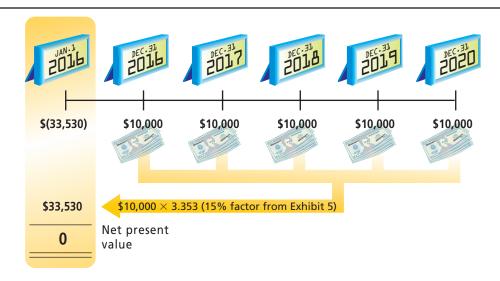
Net present value

\$2,520

In Exhibit 7, the \$36,050 present value of the cash inflows, based on a 12% rate of return, is greater than the \$33,530 to be invested. Thus, the internal rate of return must be greater than 12%. Through trial and error, the rate of return equating the \$33,530 cost of the investment with the present value of the net cash flows can be determined to be 15%, as shown in Exhibit 8.

#### **EXHIBIT 8**

Present Value of an Annuity at the Internal Rate of Return Rate



When equal annual net cash flows are expected from a proposal, as in the preceding example, the internal rate of return can be determined as follows:⁴

• Step 1. Determine a present value factor for an annuity of \$1 as follows:

Present Value Factor for an Annuity of \$1 = 
$$\frac{\text{Amount to Be Invested}}{\text{Equal Annual Net Cash Flows}}$$

- Step 2. Locate the present value factor determined in Step 1 in the present value of an annuity of \$1 table (Exhibit 5) as follows:
  - a. Locate the number of years of expected useful life of the investment in the Year column.
  - b. Proceed horizontally across the table until you find the present value factor computed in Step 1.
- Step 3. Identify the internal rate of return by the heading of the column in which the present value factor in Step 2 is located.

To illustrate, assume that management is evaluating the following proposal to purchase new equipment:

Cost of new equipment	\$97,360
Yearly expected cash flows to be received	\$20,000
Expected useful life	7 years

⁴To simplify, equal annual net cash flows are assumed. If the net cash flows are not equal, spreadsheet software can be used to determine the rate of return.

The present value factor for an annuity of \$1 is 4.868, computed as follows:

Present Value Factor for an Annuity of \$1 = 
$$\frac{\text{Amount to Be Invested}}{\text{Equal Annual Net Cash Flows}}$$

$$= \frac{\$97,360}{\$20,000} = 4.868$$

Using the partial present value of an annuity of \$1 table shown in Exhibit 9 and a period of seven years, the factor 4.868 is related to 10%. Thus, the internal rate of return for this proposal is 10%.

#### **EXHIBIT 9**

#### Steps to Determine the Internal Rate of Return

			Step 3	
,	Year	6%	10% 🔫	12%
	1	0.943	0.909	0.893
	2	1.833	1.736	1.690
	3	2.673	2.487	2.402
	4	3.465	3.170	3.037
	5	4.212	3.791	3.605
	6	4.917	Step 2(b) 4.355	4.111
Step 2(a)	7 —	5.582	<b>→ 4.868</b>	4.564
	8	6.210	5.335	4.968
	9	6.802	5.759	5.328
	10	7.360	6.145	5.650
•	•	esent value annuity of \$1	$=\frac{\$97,360}{\$20,000}=4.868$	

If the minimum acceptable rate of return is 10%, then the proposal is considered acceptable. Several proposals can be ranked by their internal rates of return. The proposal with the highest rate is the most desirable.

The internal rate of return method has the following three advantages:

- It considers the cash flows of the investment.
- It considers the time value of money.
- It ranks proposals based upon the cash flows over their complete useful life, even if the project lives are not the same.

The internal rate of return method has the following two disadvantages:

- It has complex computations, requiring a computer if the periodic cash flows are not equal.
- It assumes the cash received from a proposal can be reinvested at the internal rate of return, which may not be valid.

### Example Exercise 25-4 Internal Rate of Return



A project is estimated to cost \$208,175 and provide annual net cash flows of \$55,000 for six years. Determine the internal rate of return for this project, using Exhibit 5.

### Follow My Example 25-4

15%  $[(\$208,175 \div \$55,000) = 3.785$ , the present value of an annuity factor for six periods at 15%, from Exhibit 5]

Practice Exercises: PE 25-4A, PE 25-4B



## Business Connection

#### PANERA BREAD STORE RATE OF RETURN

Panera Bread owns, operates, and franchises bakerycafes throughout the United States. A recent annual report to the Securities and Exchange Commission (SEC Form 10-K) allowed the following information to be determined about an average company-owned store:

> \$ 470,000 Operating profit 96,000 Depreciation Investment book value 1,000,000

Assume that the operating profit and depreciation will remain unchanged for the next 15 years. Assume operating profit plus depreciation approximates annual net cash flows and that the investment residual value will be zero. Lastly, assume the investment book value approximates the current investment required to open a store. The average rate of return and internal rate of return can then be estimated. The average rate of return on a company-owned store is:

$$\frac{\$470,000}{\$1,000,000 \div 2} = 94\%$$

The internal rate of return is calculated by first determining the present value of an annuity of \$1:

Present Value of an Annuity of \$1 = 
$$\frac{$1,000,000}{$470,000 + $96,000} = 1.77$$

For a period of three years, this factor implies an internal rate of return of more than 20% (from Exhibit 5). However, if we more realistically assumed these cash flows for 15 years, Panera's company-owned stores generate an estimated internal rate of return of approximately 57% (from a spreadsheet calculation). Clearly, both investment evaluation methods indicate a highly successful business.

Source: Panera Bread, Form 10-K for the Fiscal Year Ended December 25, 2012.



### **Factors That Complicate Capital Investment Analysis**

Four widely used methods of evaluating capital investment proposals have been described and illustrated in this chapter. In practice, additional factors such as the following may impact capital investment decisions:

- Income tax
- Proposals with unequal lives
- Leasing versus purchasing
- Uncertainty
- Changes in price levels
- Qualitative factors

#### **Income Tax**

The impact of income taxes on capital investment decisions can be material. For example, in determining depreciation for federal income tax purposes, useful lives that are much shorter than the actual useful lives are often used. Also, depreciation for tax purposes often differs from depreciation for financial statement purposes. As a result, the timing of the cash flows for income taxes can have a significant impact on capital investment analysis.5

### **Unequal Proposal Lives**

The prior capital investment illustrations assumed that the alternative proposals had the same useful lives. In practice, however, proposals often have different lives.

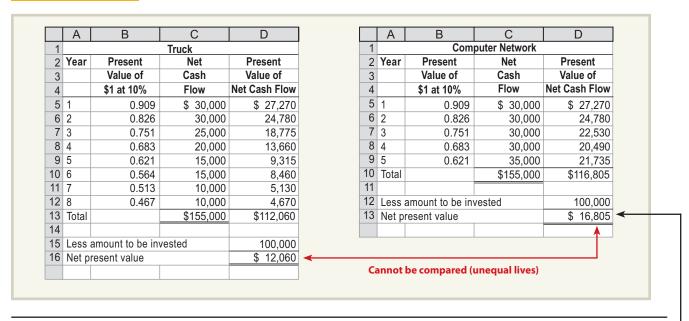
To illustrate, assume that a company is considering purchasing a new truck or a new computer network. The data for each proposal follows:

⁵ The impact of taxes on capital investment analysis is covered in advanced accounting textbooks

	Truck	Computer Network
Cost	\$100,000	\$100,000
Minimum desired rate of return	10%	10%
Expected useful life	8 years	5 years
Yearly expected cash flows to be received:		
Year 1	\$ 30,000	\$ 30,000
Year 2	30,000	30,000
Year 3	25,000	30,000
Year 4	20,000	30,000
Year 5	15,000	35,000
Year 6	15,000	0
Year 7	10,000	0
Year 8	10,000	0
Total	\$155,000	\$155,000

The expected cash flows and net present value for each proposal are shown in Exhibit 10. Because of the unequal useful lives, however, the net present values in Exhibit 10 are not comparable.

#### **EXHIBIT 10** Net Present Value Analysis—Unequal Lives of Proposals



1	А	B Truck—Revise	C d to 5-Year Life	D	Truck Net Present Value Greater than	Net Present Value
2 3 4	Year	Present Value of \$1 at 10%	Net Cash Flow	Present Value of Net Cash Flow	Computer Network Net Present Value by \$1,835	Analysis—Equalized Lives of Proposals
5	1	0.909	\$ 30,000	\$ 27,270		
6	2	0.826	30,000	24,780		
7	3	0.751	25,000	18,775		
8	4	0.683	20,000	13,660		
9	5	0.621	15,000	9,315		
10	5 (Residual					
11	value)	0.621	40,000	24,840		
12	Total		\$160,000	\$118,640		
13						
14	Less amount	to be invested		100,000		
15	Net present v	/alue		\$ 18,640	Compared (equal lives)	

To make the proposals comparable, the useful lives are adjusted to end at the same time. In this illustration, this is done by assuming that the truck will be sold at the end of five years. The selling price (residual value) of the truck at the end of five years is estimated and included in the cash inflows. Both proposals will then cover five years; thus, the net present value analyses will be comparable.

To illustrate, assume that the truck's estimated selling price (residual value) at the end of Year 5 is \$40,000. Exhibit 11 shows the truck's revised present value analysis assuming a five-year life.

As shown in Exhibit 11, the net present value for the truck exceeds the net present value for the computer network by 1.835 (18.640 - 16.805). Thus, the truck is the more attractive of the two proposals.

#### Example Exercise 25-5 Net Present Value—Unequal Lives



Project 1 requires an original investment of \$50,000. The project will yield cash flows of \$12,000 per year for seven years. Project 2 has a calculated net present value of \$8,900 over a five-year life. Project 1 could be sold at the end of five years for a price of \$30,000. (a) Determine the net present value of Project 1 over a five-year life, with residual value, assuming a minimum rate of return of 12%. (b) Which project provides the greatest net present value?

#### Follow My Example 25-5

- b. Project 1—\$10,270 is greater than the net present value of Project 2, \$8,900.

Practice Exercises: PE 25-5A, PE 25-5B

### **Lease Versus Capital Investment**

Leasing fixed assets is common in many industries. For example, hospitals often lease medical equipment. Some advantages of leasing a fixed asset include the following:

- The company has use of the fixed asset without spending large amounts of cash to purchase the asset.
- The company eliminates the risk of owning an obsolete asset.
- The company may deduct the annual lease payments for income tax purposes.

A disadvantage of leasing a fixed asset is that it is normally more costly than purchasing the asset. This is because the lessor (owner of the asset) includes in the rental price not only the costs of owning the asset, but also a profit.

The methods of evaluating capital investment proposals illustrated in this chapter can also be used to decide whether to lease or purchase a fixed asset.

### **Uncertainty**

All capital investment analyses rely on factors that are uncertain. For example, estimates of revenues, expenses, and cash flows are uncertain. This is especially true for long-term capital investments. Errors in one or more of the estimates could lead to incorrect decisions. Methods that consider the impact of uncertainty on capital investment analysis are discussed in advanced accounting and finance textbooks.

## Service Focus



#### IF YOU BUILD IT, THEY WILL COME

A business model describes how an organization delivers products or services to make a profit. Many service companies use what is termed a network business model. A network business model connects people and businesses with each other or to a centralized service. Examples of network service businesses include telecommunication, transportation, power and natural gas distribution, cable, satellite, and internet companies. Network businesses often require significant investment in physical assets in order to create the network. Often this is described as a Field of Dreams strategy (from the movie of that name) because the network can only generate revenue once it is largely built. For example, a cell phone company draws value from having many cell towers linking many callers together. A critical mass of cell towers must be pre-built in order to establish the business. This is risky. As a result, network business carefully evaluate capital investments prior to building networks.

### **Changes in Price Levels**

Price levels normally change as the economy improves or deteriorates. General price levels often increase in a rapidly growing economy, which is called **inflation**. During such periods, the rate of return on an investment should exceed the rising price level. If this is not the case, the cash returned on the investment will be less than expected.

Price levels may also change for foreign investments. This occurs as currency exchange rates change. Currency exchange rates are the rates at which currency in another country can be exchanged for U.S. dollars.

If the amount of local dollars that can be exchanged for one U.S. dollar increases, then the local currency is said to be weakening to the dollar. When a company has an investment in another country where the local currency is weakening, the return on the investment, as expressed in U.S. dollars, is adversely impacted. This is because the expected amount of local currency returned on the investment would purchase fewer U.S. dollars.⁶

#### **Qualitative Considerations**

Some benefits of capital investments are qualitative in nature and cannot be estimated in dollar terms. However, if a company does not consider qualitative considerations, an acceptable investment proposal could be rejected.

Some examples of qualitative considerations that may influence capital investment analysis include the investment proposal's impact on the following:

- Product quality
- · Manufacturing flexibility
- Employee morale
- Manufacturing productivity
- Market (strategic) opportunities

Many qualitative factors may be as important as, if not more important than, quantitative factors.

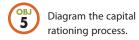
### Integrity, Objectivity, and Ethics in Business



#### **ASSUMPTION FUDGING**

The results of any capital budgeting analysis depend on many subjective estimates, such as the cash flows, discount rate, time period, and total investment amount. The results of the analysis should be used to either support or reject a project. Capital budgeting should not be used to justify an assumed net present value. That is, the analyst should not work backwards, filling in assumed numbers that will produce the desired net present value. Such a reverse approach reduces the credibility of the entire process.

⁶ Further discussion on accounting for foreign currency transactions is available on the companion Web site at www.cengagebrain.com.



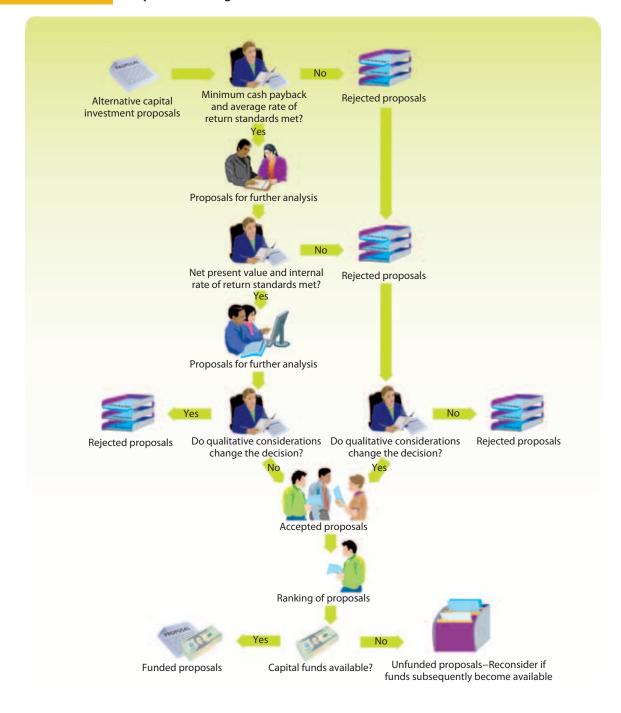
### **Capital Rationing**

**Capital rationing** is the process by which management allocates funds among competing capital investment proposals. In this process, management often uses a combination of the methods described in this chapter.

Exhibit 12 illustrates the capital rationing decision process. Alternative proposals are initially screened by establishing minimum standards, using the cash payback and the average rate of return methods. The proposals that survive this screening are further analyzed, using the net present value and internal rate of return methods.

#### **EXHIBIT 12**

#### **Capital Rationing Decision Process**



Qualitative factors related to each proposal should also be considered throughout the capital rationing process. For example, new equipment might improve the quality of the product and, thus, increase consumer satisfaction and sales.

At the end of the capital rationing process, accepted proposals are ranked and compared with the funds available. Proposals that are selected for funding are included in the capital expenditures budget. Unfunded proposals may be reconsidered if funds later become available.

# At a Glance 25



#### Explain the nature and importance of capital investment analysis.

**Key Points** Capital investment analysis is the process by which management plans, evaluates, and controls investments involving fixed assets. Capital investment analysis is important to a business because such investments affect profitability for a long period of time.

Learning Outcome	Example Exercises	Practice Exercises
• Describe the purpose of capital investment analysis.		



#### Evaluate capital investment proposals, using the average rate of return and cash payback methods.

**Key Points** The average rate of return method measures the expected profitability of an investment in fixed assets. The expected period of time that will pass between the date of an investment and the complete recovery in cash (or equivalent) of the amount invested is the cash payback period.

Learning Outcomes	Example Exercises	Practice Exercises
• Compute the average rate of return of a project.	EE25-1	PE25-1A, 25-1B
• Compute the cash payback period of a project.	EE25-2	PE25-2A, 25-2B



#### Evaluate capital investment proposals, using the net present value and internal rate of return methods.

**Key Points** The net present value method uses present values to compute the net present value of the cash flows expected from a proposal. The internal rate of return method uses present values to compute the rate of return from the net cash flows expected from capital investment proposals.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Compute the net present value of a project.</li> </ul>	EE25-3	PE25-3A, 25-3B
• Compute the internal rate of return of a project.	EE25-4	PE25-4A, 25-4B



#### List and describe factors that complicate capital investment analysis.

**Key Points** Factors that may complicate capital investment analysis include the impact of income tax, unequal lives of alternative proposals, leasing, uncertainty, changes in price levels, and qualitative considerations.

Learning Outcomes	Example Exercises	Practice Exercises
• Describe the impact of income taxes in capital investment analysis.		
• Evaluate projects with unequal lives.	EE25-5	PE25-5A, 25-5B
• Describe leasing versus capital investment.		
• Describe uncertainty, changes in price levels, and qualitative considerations in capital investment analysis.		



#### Diagram the capital rationing process.

**Key Points** Capital rationing refers to the process by which management allocates available investment funds among competing capital investment proposals. A diagram of the capital rationing process appears in Exhibit 12.

Learning Outcomes	Example Exercises	Practice Exercises
• Define capital rationing.		
Diagram the capital rationing process.		

### **Key Terms**

annuity (1167) average rate of return (1163) capital investment analysis (1162) capital rationing (1178) cash payback period (1164) currency exchange rate (1177) inflation (1177) internal rate of return (IRR) method (1171) net present value method (1169) present value concepts (1166) present value index (1170) present value of an annuity (1168) time value of money concept (1162)

### **Illustrative Problem**

The capital investment committee of Hopewell Company is currently considering two investments. The estimated income from operations and net cash flows expected from each investment are as follows:

Truck			Equipment		
Year	Income from Operations	Net Cash Flow	Income from Operations	Net Cash Flow	
1	\$ 6,000	\$ 22,000	\$13,000	\$ 29,000	
2	9,000	25,000	10,000	26,000	
3	10,000	26,000	8,000	24,000	
4	8,000	24,000	8,000	24,000	
5	11,000	27,000	3,000	19,000	
	\$44,000	\$124,000	\$42,000	\$122,000	

Each investment requires \$80,000. Straight-line depreciation will be used, and no residual value is expected. The committee has selected a rate of 15% for purposes of the net present value analysis.

#### **Instructions**

- 1. Compute the following:
  - a. The average rate of return for each investment.
  - b. The net present value for each investment. Use the present value of \$1 table appearing in this chapter (Exhibit 2).
- 2. Why is the net present value of the equipment greater than the truck, even though its average rate of return is less?
- 3. Prepare a summary for the capital investment committee, advising it on the relative merits of the two investments.

#### Solution

1. a. Average rate of return for the truck:

$$\frac{\$44,000 \div 5}{(\$80,000 + \$0) \div 2} = 22\%$$

Average rate of return for the equipment:

$$\frac{\$42,000 \div 5}{(\$80,000 + \$0) \div 2} = 21\%$$

b. Net present value analysis:

	Present Value	Net Cash Flow		Present Value of Net Cash Flow	
Year	of \$1 at 15%	Truck	Equipment	Truck	Equipment
1	0.870	\$ 22,000	\$ 29,000	\$19,140	\$25,230
2	0.756	25,000	26,000	18,900	19,656
3	0.658	26,000	24,000	17,108	15,792
4	0.572	24,000	24,000	13,728	13,728
5	0.497	27,000	19,000	13,419	9,443
Total		\$124,000	\$122,000	\$82,295	\$83,849
Less amo	ount to be invested			80,000	80,000
Net pres	ent value			\$ 2,295	\$ 3,849

- 2. The equipment has a lower average rate of return than the truck because the equipment's total income from operations for the five years is \$42,000, which is \$2,000 less than the truck's. Even so, the net present value of the equipment is greater than that of the truck because the equipment has higher cash flows in the early years.
- 3. Both investments exceed the selected rate established for the net present value analysis. The truck has a higher average rate of return, but the equipment offers a larger net present value. Thus, if only one of the two investments can be accepted, the equipment would be the more attractive.

### **Discussion Questions**

- 1. What are the principal objections to the use of the average rate of return method in evaluating capital investment proposals?
- 2. Discuss the principal limitations of the cash payback method for evaluating capital investment proposals.
- 3. Why would the average rate of return differ from the internal rate of return on the same project?
- 4. Your boss has suggested that a one-year payback period is the same as a 100% average rate of return. Do you agree?
- 5. Why would the cash payback method understate the attractiveness of a project with a large residual value?
- 6. Why would the use of the cash payback period for analyzing the financial performance of theatrical releases from a motion picture production studio be supported over the net present value method?

- 7. A net present value analysis used to evaluate a proposed equipment acquisition indicated a \$7,900 net present value. What is the meaning of the \$7,900 as it relates to the desirability of the proposal?
- 8. Two projects have an identical net present value of \$9,000. Are both projects equal in desirability?
- 9. What are the major disadvantages of the use of the net present value method of analyzing capital investment proposals?
- 10. What are the major disadvantages of the use of the internal rate of return method of analyzing capital investment proposals?
- 11. What are the major advantages of leasing a fixed asset rather than purchasing it?
- 12. Give an example of a qualitative factor that should be considered in a capital investment analysis related to acquiring automated factory equipment.

### **Practice Exercises**

**EE 25-1** p.1164

#### PE 25-1A Average rate of return

OBJ. 2



Determine the average rate of return for a project that is estimated to yield total income of \$170,000 over five years, has a cost of \$320,000, and has a \$20,000 residual value.

**EE 25-1** p.1164

#### PE 25-1B Average rate of return

OBJ. 2



Determine the average rate of return for a project that is estimated to yield total income of \$36,000 over three years, has a cost of \$70,000, and has a \$10,000 residual value.

**EE 25-2** *p.1166* 

#### PE 25-2A Cash payback period

OBJ. 2

A project has estimated annual net cash flows of \$118,600. It is estimated to cost \$616,720. Determine the cash payback period. Round to one decimal place.

ME HOW

ME HOW

**EE 25-2** *p.1166* 

#### PE 25-2B Cash payback period

OBJ. 2

A project has estimated annual net cash flows of \$9,300. It is estimated to cost \$41,850. Determine the cash payback period. Round to one decimal place.

**EE 25-3** *p.1171* 

#### PE 25-3A Net present value

OBJ. 3

A project has estimated annual net cash flows of \$6,800 for five years and is estimated to cost \$23,125. Assume a minimum acceptable rate of return of 12%. Using Exhibit 5, determine (1) the net present value of the project and (2) the present value index, rounded to two decimal places.

**EE 25-3** *p.1171* 

#### PE 25-3B Net present value

OBJ. 3



ME HOW

A project has estimated annual net cash flows of \$96,200 for four years and is estimated to cost \$315,500. Assume a minimum acceptable rate of return of 10%. Using Exhibit 5, determine (1) the net present value of the project and (2) the present value index, rounded to two decimal places.

**EE 25-4** *p.1173* 

#### PE 25-4A Internal rate of return

OBJ.

A project is estimated to cost \$104,328 and provide annual net cash flows of \$21,000 for eight years. Determine the internal rate of return for this project, using Exhibit 5.

SHOW ME HOW

**EE 25-4** *p.1173* 

#### PE 25-4B Internal rate of return

OBJ. 3

A project is estimated to cost \$362,672 and provide annual net cash flows of \$76,000 for nine years. Determine the internal rate of return for this project, using Exhibit 5.

SHOW ME HOW

**EE 25-5** *p.1176* 

#### PE 25-5A Net present value—unequal lives

OBJ. 4

Project A requires an original investment of \$32,600. The project will yield cash flows of \$7,000 per year for nine years. Project B has a calculated net present value of \$3,500 over a six-year life. Project A could be sold at the end of six years for a price of \$15,000. (a) Determine the net present value of Project A over a six-year life, with residual value, assuming a minimum rate of return of 12%. (b) Which project provides the greatest net present value?

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SHOW ME HOW **EE 25-5** p.1176

#### PE 25-5B Net present value—unequal lives

OBJ. 4

Project 1 requires an original investment of \$55,000. The project will yield cash flows of \$15,000 per year for seven years. Project 2 has a calculated net present value of \$5,000 over a four-year life. Project 1 could be sold at the end of four years for a price of \$38,000. (a) Determine the net present value of Project 1 over a four-year life, with residual value, assuming a minimum rate of return of 20%. (b) Which project provides the greatest net present value?

### **Exercises**

#### EX 25-1 Average rate of return

OBJ. 2

✓ Testing equipment,
7%



The following data are accumulated by ChemLab Inc. in evaluating two competing capital investment proposals:

	Testing Equipment	Vehicle
Amount of investment	\$86,000	\$30,000
Useful life	6 years	8 years
Estimated residual value	0	0
Estimated total income over the useful life	\$18,060	\$12,000

Determine the expected average rate of return for each proposal.

#### EX 25-2 Average rate of return—cost savings

OBJ. 2

Midwest Fabricators Inc. is considering an investment in equipment that will replace direct labor. The equipment has a cost of \$132,000 with a \$16,000 residual value and a 10-year life. The equipment will replace one employee who has an average wage of \$34,000 per year. In addition, the equipment will have operating and energy costs of \$5,380 per year.

Determine the average rate of return on the equipment, giving effect to straight-line depreciation on the investment.

#### EX 25-3 Average rate of return—new product

OBJ. 2

Galactic Inc. is considering an investment in new equipment that will be used to manufacture a smartphone. The phone is expected to generate additional annual sales of 6,000 units at \$250 per unit. The equipment has a cost of \$850,000, residual value of \$50,000, and an eight-year life. The equipment can only be used to manufacture the phone. The cost to manufacture the phone follows:

		• • •
( Act	nar	unit:
COSL	עכו	uiiit.

Direct labor	\$ 15.00
Direct materials	134.00
Factory overhead (including depreciation)	33.50
Total cost per unit	\$182.50

Determine the average rate of return on the equipment.

#### EX 25-4 Calculate cash flows

OBJ. 2

Nature's Way Inc. is planning to invest in new manufacturing equipment to make a new garden tool. The new garden tool is expected to generate additional annual sales of 2,500 units at \$60 each. The new manufacturing equipment will cost \$227,000 and is expected to have a 10-year life and \$17,000 residual value. Selling expenses related to the new product are expected to be 5% of sales revenue. The cost to manufacture the product includes the following on a per-unit basis:

\$ 8.00
22.00
8.40
3.60
\$42.00

Determine the net cash flows for the first year of the project, Years 2–9, and for the last year of the project.

#### **EX 25-5** Cash payback period for a service company

OBJ. 2

Fidelity Bancorp Inc. is evaluating two capital investment proposals for a drive-up ATM kiosk, each requiring an investment of \$280,000 and each with an eight-year life and expected total net cash flows of \$448,000. Location 1 is expected to provide equal annual net cash flows of \$56,000, and Location 2 is expected to have the following unequal annual net cash flows:

Year 1	\$90,000	Year 5	\$42,000
Year 2	70,000	Year 6	42,000
Year 3	60,000	Year 7	42,000
Year 4	60.000	Year 8	42.000

Determine the cash payback period for both location proposals.

✓ Average annual income, \$405,000



Year 1: \$(168,500)



✓ Location 1: 5 years





# X

#### EX 25-6 Cash payback method

OBJ. 2

Lily Products Company is considering an investment in one of two new product lines. The investment required for either product line is \$540,000. The net cash flows associated with each product are as follows:

Year	Liquid Soap	<b>Body Lotion</b>
1	\$170,000	\$ 90,000
2	150,000	90,000
3	120,000	90,000
4	100,000	90,000
5	70,000	90,000
6	40,000	90,000
7	40,000	90,000
8	30,000	90,000
Total	\$720,000	\$720,000

- a. Recommend a product offering to Lily Products Company, based on the cash payback period for each product line.
- b. Why is one product line preferred over the other, even though they both have the same total net cash flows through eight periods?

#### EX 25-7 Net present value method

OBJ. 3

The following data are accumulated by Dillon Company in evaluating the purchase of \$39,600 of equipment, having a four-year useful life:

	Net Income	<b>Net Cash Flow</b>
Year 1	\$ 4,100	\$14,000
Year 2	8,100	18,000
Year 3	7,100	17,000
Year 4	2,100	12,000

- a. Assuming that the desired rate of return is 15%, determine the net present value for the proposal. Use the table of the present value of \$1 appearing in Exhibit 2 of this chapter.
- b. Would management be likely to look with favor on the proposal? Explain.

#### ✓ a. 2016, \$13,000

✓ a. NPV, \$4,238



#### EX 25-8 Net present value method for a service company

OBJ. 3

AM Express Inc. is considering the purchase of an additional delivery vehicle for \$55,000 on January 1, 2016. The truck is expected to have a five-year life with an expected residual value of \$15,000 at the end of five years. The expected additional revenues from the added delivery capacity are anticipated to be \$58,000 per year for each of the next five years. A driver will cost \$42,000 in 2016, with an expected annual salary increase of \$1,000 for each year thereafter. The annual operating costs for the truck are estimated to be \$3,000 per year.

- a. Determine the expected annual net cash flows from the delivery truck investment for 2016–2020.
- b. Calculate the net present value of the investment, assuming that the minimum desired rate of return is 12%. Use the present value of \$1 table appearing in Exhibit 2 of this chapter.
- c. Is the additional truck a good investment based on your analysis? Explain.

#### ✓ a. \$22 million





#### EX 25-9 Net present value method—annuity for a service company

OBJ. 3

Winter Lake Hotels is considering the construction of a new hotel for \$150 million. The expected life of the hotel is 30 years, with no residual value. The hotel is expected to earn revenues of \$55 million per year. Total expenses, including depreciation, are expected to be \$38 million per year. Winter Lake management has set a minimum acceptable rate of return of 14%.

(Continued)

- a. Determine the equal annual net cash flows from operating the hotel.
- b. Calculate the net present value of the new hotel, using the present value of an annuity of \$1 table found in Appendix A. Round to the nearest million dollars.
- c. Does your analysis support construction of the new hotel? Explain.

#### EX 25-10 Net present value method—annuity

OBJ. 3

✓ a. \$46,000

Briggs Excavation Company is planning an investment of \$132,000 for a bulldozer. The bulldozer is expected to operate for 1,500 hours per year for five years. Customers will be charged \$110 per hour for bulldozer work. The bulldozer operator costs \$28 per hour in wages and benefits. The bulldozer is expected to require annual maintenance costing \$8,000. The bulldozer uses fuel that is expected to cost \$46 per hour of bulldozer operation.

- a. Determine the equal annual net cash flows from operating the bulldozer.
- b. Determine the net present value of the investment, assuming that the desired rate of return is 10%. Use the present value of an annuity of \$1 table in the chapter (Exhibit 5). Round to the nearest dollar.
- c. Should Briggs invest in the bulldozer, based on this analysis? Explain.
- d. Determine the number of operating hours such that the present value of cash flows equals the amount to be invested.

#### EX 25-11 Net present value method for a service company

ORL 3

✓ a. \$157,600,000



Carnival Corporation has recently placed into service some of the largest cruise ships in the world. One of these ships, the *Carnival Breeze*, can hold up to 3,600 passengers, and it can cost \$750 million to build. Assume the following additional information:

- There will be 330 cruise days per year operated at a full capacity of 3,600 passengers.
- The variable expenses per passenger are estimated to be \$140 per cruise day.
- The revenue per passenger is expected to be \$340 per cruise day.
- The fixed expenses for running the ship, other than depreciation, are estimated to be \$80,000,000 per year.
- The ship has a service life of 10 years, with a residual value of \$140,000,000 at the end of 10 years.
- a. Determine the annual net cash flow from operating the cruise ship.
- b. Determine the net present value of this investment, assuming a 12% minimum rate of return. Use the present value tables provided in the chapter in determining your answer.

#### EX 25-12 Present value index

ORL 3

✓ Ft. Collins, 0.98

Dip N' Dunk Doughnuts has computed the net present value for capital expenditure at two locations. Relevant data related to the computation are as follows:

	Ft. Collins	Boulder
Total present value of net cash flow	\$607,600	\$624,000
Less amount to be invested	620,000	600,000
Net present value	\$(12,400)	\$ 24,000

- a. Determine the present value index for each proposal.
- b. Which location does your analysis support? Explain.

✓ b. Packing machine, 1.55

#### EX 25-13 Net present value method and present value index

OBJ. 3

Diamond & Turf Inc. is considering an investment in one of two machines. The sewing machine will increase productivity from sewing 150 baseballs per hour to sewing 290 per hour. The contribution margin per unit is \$0.32 per baseball. Assume that any increased production of baseballs can be sold. The second machine is an automatic packing machine for the golf ball line. The packing machine will reduce packing labor cost. The labor cost saved is equivalent to \$21 per hour. The sewing machine will cost \$260,000, have an eight-year life, and will operate for 1,800 hours per year. The packing machine will cost \$85,000, have an eight-year life, and will operate for 1,400 hours per year. Diamond & Turf seeks a minimum rate of return of 15% on its investments.

- a. Determine the net present value for the two machines. Use the present value of an annuity of \$1 table in the chapter (Exhibit 5). Round to the nearest dollar.
- b. Determine the present value index for the two machines. Round to two decimal places.
- c. If Diamond & Turf has sufficient funds for only one of the machines and qualitative factors are equal between the two machines, in which machine should it invest? Explain.

### **EX 25-14** Average rate of return, cash payback period, net present value method for a service company

OBJ. 2, 3

Bi-Coastal Railroad Inc. is considering acquiring equipment at a cost of \$520,000. The equipment has an estimated life of eight years and no residual value. It is expected to provide yearly net cash flows of \$104,000. The company's minimum desired rate of return for net present value analysis is 10%.

Compute the following:

- a. The average rate of return, giving effect to straight-line depreciation on the investment.
- b. The cash payback period.
- c. The net present value. Use the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5). Round to the nearest dollar.

### EX 25-15 Cash payback period, net present value analysis, and qualitative OBJ. 2, 3, 4 considerations

The plant manager of Shenzhen Electronics Company is considering the purchase of new automated assembly equipment. The new equipment will cost \$1,400,000. The manager believes that the new investment will result in direct labor savings of \$350,000 per year for 10 years.

- a. What is the payback period on this project?
- b. What is the net present value, assuming a 10% rate of return? Use the present value of an annuity of \$1 table in Exhibit 5.
- c. What else should the manager consider in the analysis?

#### EX 25-16 Internal rate of return method

OBJ. 3

The internal rate of return method is used by Testerman Construction Co. in analyzing a capital expenditure proposal that involves an investment of \$113,550 and annual net cash flows of \$30,000 for each of the six years of its useful life.

- a. Determine a present value factor for an annuity of \$1, which can be used in determining the internal rate of return.
- b. Using the factor determined in part (a) and the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5), determine the internal rate of return for the proposal.

✓ b. 5 years





✓ a. 4 years

✓ a. 3.785





#### EX 25-17 Internal rate of return method for a service company

**OBJ. 3, 4** 

The Canyons Resort, a Utah ski resort, recently announced a \$415 million expansion of lodging properties, lifts, and terrain. Assume that this investment is estimated to produce \$99 million in equal annual cash flows for each of the first 10 years of the project life.

- a. Determine the expected internal rate of return of this project for 10 years, using the present value of an annuity of \$1 table found in Exhibit 5.
- b. What are some uncertainties that could reduce the internal rate of return of this project?

#### EX 25-18 Internal rate of return method—two projects

OBJ. 3

✓ a. Delivery truck, 15%

Munch N' Crunch Snack Company is considering two possible investments: a delivery truck or a bagging machine. The delivery truck would cost \$43,056 and could be used to deliver an additional 95,000 bags of pretzels per year. Each bag of pretzels can be sold for a contribution margin of \$0.45. The delivery truck operating expenses, excluding depreciation, are \$1.35 per mile for 24,000 miles per year. The bagging machine would replace an old bagging machine, and its net investment cost would be \$61,614. The new machine would require three fewer hours of direct labor per day. Direct labor is \$18 per hour. There are 250 operating days in the year. Both the truck and the bagging machine are estimated to have seven-year lives. The minimum rate of return is 13%. However, Munch N' Crunch has funds to invest in only one of the projects.

- a. Compute the internal rate of return for each investment. Use the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5).
- b. Provide a memo to management, with a recommendation.

### **EX 25-19** Net present value method and internal rate of return method for a service company

**OBJ. 3** 

✓ a. (\$12,845)



Buckeye Healthcare Corp. is proposing to spend \$186,725 on an eight-year project that has estimated net cash flows of \$35,000 for each of the eight years.

- a. Compute the net present value, using a rate of return of 12%. Use the present value of an annuity of \$1 table in the chapter (Exhibit 5).
- b. Based on the analysis prepared in part (a), is the rate of return (1) more than 12%, (2) 12%, or (3) less than 12%? Explain.
- c. Determine the internal rate of return by computing a present value factor for an annuity of \$1 and using the present value of an annuity of \$1 table presented in the text (Exhibit 5).

#### **EX 25-20** Identify error in capital investment analysis calculations

OBJ. 3

Artscape Inc. is considering the purchase of automated machinery that is expected to have a useful life of five years and no residual value. The average rate of return on the average investment has been computed to be 20%, and the cash payback period was computed to be 5.5 years.

Do you see any reason to question the validity of the data presented? Explain.

#### EX 25-21 Net present value—unequal lives

**OBJ. 3, 4** 

Bunker Hill Mining Company has two competing proposals: a processing mill and an electric shovel. Both pieces of equipment have an initial investment of \$750,000. The net cash flows estimated for the two proposals are as follows:

#### ✓ Net present value, Processing mill, \$196,220



#### **Net Cash Flow**

Year	Processing Mill	Electric Shovel
1	\$310,000	\$330,000
2	260,000	325,000
3	260,000	325,000
4	260,000	320,000
5	180,000	
6	130,000	
7	120,000	
8	120,000	

The estimated residual value of the processing mill at the end of Year 4 is \$280,000.

Determine which equipment should be favored, comparing the net present values of the two proposals and assuming a minimum rate of return of 15%. Use the present value tables presented in this chapter (Exhibits 2 and 5).

#### EX 25-22 Net present value—unequal lives

OBJ. 3, 4

Daisy's Creamery Inc. is considering one of two investment options. Option 1 is a \$75,000 investment in new blending equipment that is expected to produce equal annual cash flows of \$19,000 for each of seven years. Option 2 is a \$90,000 investment in a new computer system that is expected to produce equal annual cash flows of \$27,000 for each of five years. The residual value of the blending equipment at the end of the fifth year is estimated to be \$15,000. The computer system has no expected residual value at the end of the fifth year.

Assume there is sufficient capital to fund only one of the projects. Determine which project should be selected, comparing the (a) net present values and (b) present value indices of the two projects. Assume a minimum rate of return of 10%. Round the present value index to two decimal places. Use the present value tables presented in this chapter (Exhibits 2 and 5).

### **Problems: Series A**

## PR 25-1A Average rate of return method, net present value method, and analysis for a service company

OBJ. 2, 3

✓ 1. a. 34%







The capital investment committee of Touch of Eden Landscaping Company is considering two capital investments. The estimated income from operations and net cash flows from each investment are as follows:

	Front-End Loader		Greenhous	e Fixtures	
Year	Income from Operations	Net Cash Flow	Income from Operations	Net Cash Flow	
1	\$23,000	\$ 35,000	\$10,200	\$ 22,200	
2	20,000	32,000	10,200	22,200	
3	12,000	24,000	10,200	22,200	
4	(2,000)	10,000	10,200	22,200	
5	(2,000)	10,000	10,200	22,200	
	\$51,000	\$111,000	\$51,000	\$111,000	

Each project requires an investment of \$60,000. Straight-line depreciation will be used, and no residual value is expected. The committee has selected a rate of 12% for purposes of the net present value analysis.

#### **Instructions**

- 1. Compute the following:
  - a. The average rate of return for each investment. Round to one decimal place.
  - b. The net present value for each investment. Use the present value of \$1 table appearing in this chapter (Exhibit 2). Round present values to the nearest dollar.
- 2. Prepare a brief report for the capital investment committee, advising it on the relative merits of the two investments.

#### PR 25-2A Cash payback period, net present value method, and analysis

√ 1. b. Plant expansion, \$305,040



Elite Apparel Inc. is considering two investment projects. The estimated net cash flows from each project are as follows:

OBJ. 2, 3

OBJ. 3

OBJ. 3

Year	Plant Expansion	<b>Retail Store Expansion</b>
1	\$ 450,000	\$ 500,000
2	450,000	400,000
3	340,000	350,000
4	280,000	250,000
5	180,000	200,000
Total	\$1,700,000	\$1,700,000

Each project requires an investment of \$900,000. A rate of 15% has been selected for the net present value analysis.

#### **Instructions**

- 1. Compute the following for each product:
  - a. Cash payback period.
  - b. The net present value. Use the present value of \$1 table appearing in this chapter (Exhibit 2).
- 2. Prepare a brief report advising management on the relative merits of each project.

### **PR 25-3A** Net present value method, present value index, and analysis for a service company

Continental Railroad Company is evaluating three capital investment proposals by using the net present value method. Relevant data related to the proposals are summarized as follows:

	Maintenance Equipment	Ramp Facilities	Computer Network
Amount to be invested	\$8,000,000	\$20,000,000	\$9,000,000
Annual net cash flows:			
Year 1	4,000,000	12,000,000	6,000,000
Year 2	3,500,000	10,000,000	5,000,000
Year 3	2,500,000	9,000,000	4,000,000

#### **Instructions**

- 1. Assuming that the desired rate of return is 20%, prepare a net present value analysis for each proposal. Use the present value of \$1 table appearing in this chapter (Exhibit 2).
- 2. Determine a present value index for each proposal. Round to two decimal places.
- 3. Which proposal offers the largest amount of present value per dollar of investment? Explain.

## PR 25-4A Net present value method, internal rate of return method, and analysis for a service company

The management of Advanced Alternative Power Inc. is considering two capital investment projects. The estimated net cash flows from each project are as follows:

Year	Wind Turbines	Biofuel Equipment
1	\$280,000	\$300,000
2	280,000	300,000
3	280,000	300,000
4	280.000	300.000

The wind turbines require an investment of \$887,600, while the biofuel equipment requires an investment of \$911,100. No residual value is expected from either project.

✓ 2. Computer Network, 1.20





✓ 1. a. Wind turbines, \$82,600



#### **Instructions**

- 1. Compute the following for each project:
  - a. The net present value. Use a rate of 6% and the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5).
  - b. A present value index. Round to two decimal places.
- 2. Determine the internal rate of return for each project by (a) computing a present value factor for an annuity of \$1 and (b) using the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5).
- What advantage does the internal rate of return method have over the net present value method in comparing projects?

#### PR 25-5A Alternative capital investments

**OBJ. 3, 4** 

The investment committee of Sentry Insurance Co. is evaluating two projects, office expansion and upgrade to computer servers. The projects have different useful lives, but each requires an investment of \$490,000. The estimated net cash flows from each project are as follows:

#### **Net Cash Flows** Office Expansion Servers 1 \$125,000 \$165,000 2 125,000 165,000 3 125,000 165,000 4 125,000 165,000 5 125,000 125,000

The committee has selected a rate of 12% for purposes of net present value analysis. It also estimates that the residual value at the end of each project's useful life is \$0, but at the end of the fourth year, the office expansion's residual value would be \$180,000.

#### **Instructions**

- 1. For each project, compute the net present value. Use the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5). (Ignore the unequal lives of the projects.)
- 2. For each project, compute the net present value, assuming that the office expansion is adjusted to a four-year life for purposes of analysis. Use the present value of \$1 table appearing in this chapter (Exhibit 2).
- Prepare a report to the investment committee, providing your advice on the relative merits of the two projects.

#### PR 25-6A Capital rationing decision for a service company involving four proposals

Renaissance Capital Group is considering allocating a limited amount of capital investment funds among four proposals. The amount of proposed investment, estimated income from operations, and net cash flow for each proposal are as follows:

	Investment	Year	Income from Operations	Net Cash Flow
Proposal A:	\$680,000	1	\$ 64,000	\$ 200,000
		2	64,000	200,000
		3	64,000	200,000
		4	24,000	160,000
		5	24,000	160,000
			\$240,000	\$ 920,000
Proposal B:	\$320,000	1	\$ 26,000	\$ 90,000
		2	26,000	90,000
		3	6,000	70,000
		4	6,000	70,000
		5	(44,000)	20,000
			\$ 20,000	\$340,000

(Continued)

OBJ. 2, 3, 5

#### ✓ 5. Proposal C, 1.57

✓ 1. Servers, \$11,105





Proposal C:	\$108,000	1	\$ 33,400	\$ 55,000
		2	31,400	53,000
		3	28,400	50,000
		4	25,400	47,000
		5	23,400	45,000
			\$142,000	\$ 250,000
Proposal D:	\$400,000	1	\$100,000	\$ 180,000
		2	100,000	180,000
		3	80,000	160,000
		4	20,000	100,000
		5	0	80,000
			\$300,000	\$700,000

The company's capital rationing policy requires a maximum cash payback period of three years. In addition, a minimum average rate of return of 12% is required on all projects. If the preceding standards are met, the net present value method and present value indexes are used to rank the remaining proposals.

#### **Instructions**

- 1. Compute the cash payback period for each of the four proposals.
- Giving effect to straight-line depreciation on the investments and assuming no estimated residual value, compute the average rate of return for each of the four proposals. Round to one decimal place.
- 3. Using the following format, summarize the results of your computations in parts (1) and (2). By placing the calculated amounts in the first two columns on the left and by placing a check mark in the appropriate column to the right, indicate which proposals should be accepted for further analysis and which should be rejected.

Proposal	Cash Payback Period	Average Rate of Return	Accept for Further Analysis	Reject
A				
В				
C				
D				

- 4. For the proposals accepted for further analysis in part (3), compute the net present value. Use a rate of 15% and the present value of \$1 table appearing in this chapter (Exhibit 2).
- 5. Compute the present value index for each of the proposals in part (4). Round to two decimal places.
- 6. Rank the proposals from most attractive to least attractive, based on the present values of net cash flows computed in part (4).
- 7. Rank the proposals from most attractive to least attractive, based on the present value indexes computed in part (5).
- 8. Based on the analyses, comment on the relative attractiveness of the proposals ranked in parts (6) and (7).

## **Problems: Series B**

✓ 1. a. 18.7%







## **PR 25-1B** Average rate of return method, net present value method, and analysis for a service company

The capital investment committee of Ellis Transport and Storage Inc. is considering two investment projects. The estimated income from operations and net cash flows from each investment are as follows:

OBJ. 2, 3

	Wareh	ouse	Tracking Technology		
Year	Income from Operations	Net Cash Flow	Income from Operations	Net Cash Flow	
1	\$ 61,400	\$135,000	\$ 34,400	\$108,000	
2	51,400	125,000	34,400	108,000	
3	36,400	110,000	34,400	108,000	
4	26,400	100,000	34,400	108,000	
5	(3,600)	70,000	34,400	108,000	
Total	\$172,000	\$540,000	\$172,000	\$540,000	

Each project requires an investment of \$368,000. Straight-line depreciation will be used, and no residual value is expected. The committee has selected a rate of 15% for purposes of the net present value analysis.

#### **Instructions**

- 1. Compute the following:
  - a. The average rate of return for each investment. Round to one decimal place.
  - b. The net present value for each investment. Use the present value of \$1 table appearing in this chapter (Exhibit 2). Round present values to the nearest dollar.
- 2. Prepare a brief report for the capital investment committee, advising it on the relative merits of the two projects.

#### PR 25-2B Cash payback period, net present value method, and analysis for a service company

**OBJ. 2, 3** 

Social Circle Publications Inc. is considering two new magazine products. The estimated net cash flows from each product are as follows:

Year	Sound Cellar	Pro Gamer
1	\$ 65,000	\$ 70,000
2	60,000	55,000
3	25,000	35,000
4	25,000	30,000
5	45,000	30,000
Total	\$220,000	\$220,000

Each product requires an investment of \$125,000. A rate of 10% has been selected for the net present value analysis.

#### **Instructions**

- 1. Compute the following for each product:
  - a. Cash payback period.
  - b. The net present value. Use the present value of \$1 table appearing in this chapter (Exhibit 2).
- 2. Prepare a brief report advising management on the relative merits of each of the two products.

#### PR 25-3B Net present value method, present value index, and analysis for a service company

OBJ. 3

First United Bank Inc. is evaluating three capital investment projects by using the net present value method. Relevant data related to the projects are summarized as follows:



	Branch Office Expansion	Computer System Upgrade	ATM Kiosk Expansion
Amount to be invested	\$420,000	\$350,000	\$520,000
Year 1	200,000	190,000	275,000
Year 2	160,000	180,000	250,000
Year 3	160,000	170,000	250,000

(Continued)

✓ 2. Branch office expansion, 0.95

✓ 1. b. Pro Gamer,

\$49,465

#### **Instructions**

- 1. Assuming that the desired rate of return is 15%, prepare a net present value analysis for each project. Use the present value of \$1 table appearing in this chapter (Exhibit 2).
- 2. Determine a present value index for each project. Round to two decimal places.
- 3. Which project offers the largest amount of present value per dollar of investment? Explain.

## PR 25-4B Net present value method, internal rate of return method, and analysis OBJ. 3 for a service company

The management of Style Networks Inc. is considering two TV show projects. The estimated net cash flows from each project are as follows:

Year	After Hours	Sun Fun
1	\$320,000	\$290,000
2	320,000	290,000
3	320,000	290,000
4	320,000	290,000

After Hours requires an investment of \$913,600, while Sun Fun requires an investment of \$880,730. No residual value is expected from either project.

#### **Instructions**

- 1. Compute the following for each project:
  - a. The net present value. Use a rate of 10% and the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5).
  - b. A present value index. Round to two decimal places.
- 2. Determine the internal rate of return for each project by (a) computing a present value factor for an annuity of \$1 and (b) using the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5).
- 3. What advantage does the internal rate of return method have over the net present value method in comparing projects?

#### PR 25-5B Alternative capital investments

OBJ. 3, 4

The investment committee of Auntie M's Restaurants Inc. is evaluating two restaurant sites. The sites have different useful lives, but each requires an investment of \$900,000. The estimated net cash flows from each site are as follows:

	Net Cash Flows				
Year	Wichita	Topeka			
1	\$310,000	\$400,000			
2	310,000	400,000			
3	310,000	400,000			
4	310,000	400,000			
5	310,000				
6	310,000				

The committee has selected a rate of 20% for purposes of net present value analysis. It also estimates that the residual value at the end of each restaurant's useful life is \$0, but at the end of the fourth year, Wichita's residual value would be \$500,000.

#### **Instructions**

- 1. For each site, compute the net present value. Use the present value of an annuity of \$1 table appearing in this chapter (Exhibit 5). (Ignore the unequal lives of the projects.)
- 2. For each site, compute the net present value, assuming that Wichita is adjusted to a four-year life for purposes of analysis. Use the present value of \$1 table appearing in this chapter (Exhibit 2).
- 3. Prepare a report to the investment committee, providing your advice on the relative merits of the two sites.

✓ 1. a. After Hours \$100,800



√ 1. Topeka, \$135,600



## PR 25-6B Capital rationing decision for a service company involving four proposals

OBJ. 2, 3, 5

✓ 5. Proposal B, 1.13





Clearcast Communications Inc. is considering allocating a limited amount of capital investment funds among four proposals. The amount of proposed investment, estimated income from operations, and net cash flow for each proposal are as follows:

	Investment	Year	Income from Operations	Net Cash Flow
Proposal A:	\$450,000	1	\$ 30,000	\$120,000
		2	30,000	120,000
		3	20,000	110,000
		4	10,000	100,000
		5	(30,000)	60,000
			\$ 60,000	\$510,000
Proposal B:	\$200,000	1	\$ 60,000	\$100,000
		2	40,000	80,000
		3	20,000	60,000
		4	(10,000)	30,000
		5	(20,000)	20,000
			\$ 90,000	\$290,000
Proposal C:	\$320,000	1	\$ 36,000	\$100,000
		2	26,000	90,000
		3	26,000	90,000
		4	16,000	80,000
		5	16,000	80,000
			\$120,000	\$440,000
Proposal D:	\$540,000	1	\$ 92,000	\$200,000
		2	72,000	180,000
		3	52,000	160,000
		4	12,000	120,000
		5	(8,000)	100,000
			\$220,000	\$760,000

The company's capital rationing policy requires a maximum cash payback period of three years. In addition, a minimum average rate of return of 12% is required on all projects. If the preceding standards are met, the net present value method and present value indexes are used to rank the remaining proposals.

#### Instructions

- 1. Compute the cash payback period for each of the four proposals.
- 2. Giving effect to straight-line depreciation on the investments and assuming no estimated residual value, compute the average rate of return for each of the four proposals. Round to one decimal place.
- 3. Using the following format, summarize the results of your computations in parts (1) and (2). By placing the calculated amounts in the first two columns on the left and by placing a check mark in the appropriate column to the right, indicate which proposals should be accepted for further analysis and which should be rejected.

Proposal	Cash Payback Period	Average Rate of Return	Accept for Further Analysis	Reject
A				
В				
C				
D				

- 4. For the proposals accepted for further analysis in part (3), compute the net present value. Use a rate of 12% and the present value of \$1 table appearing in this chapter (Exhibit 2).
- 5. Compute the present value index for each of the proposals in part (4). Round to two decimal places.

(Continued)

- 6. Rank the proposals from most attractive to least attractive, based on the present values of net cash flows computed in part (4).
- 7. Rank the proposals from most attractive to least attractive, based on the present value indexes computed in part (5). Round to two decimal places.
- Based on the analyses, comment on the relative attractiveness of the proposals ranked in parts (6) and (7).

### **Cases & Projects**



#### CP 25-1 Ethics and professional conduct in business

Danielle Hastings was recently hired as a cost analyst by CareNet Medical Supplies Inc. One of Danielle's first assignments was to perform a net present value analysis for a new warehouse. Danielle performed the analysis and calculated a present value index of 0.75. The plant manager, Jerrod Moore, is very intent on purchasing the warehouse because he believes that more storage space is needed. Jerrod asks Danielle into his office and the following conversation takes place:

Jerrod: Danielle, you're new here, aren't you?

Danielle: Yes, I am.

Jerrod: Well, Danielle, I'm not at all pleased with the capital investment analysis that you performed on this new warehouse. I need that warehouse for my production. If I don't get it, where am I going to place our output?

Danielle: Well, we need to get product into our customers' hands.

Jerrod: I agree, and we need a warehouse to do that.

Danielle: My analysis does not support constructing a new warehouse. The numbers don't lie; the warehouse does not meet our investment return targets. In fact, it seems to me that purchasing a warehouse does not add much value to the business. We need to be producing product to satisfy customer orders, not to fill a warehouse.

Jerrod: The headquarters people will not allow me to build the warehouse if the numbers don't add up. You know as well as I that many assumptions go into your net present value analysis. Why don't you relax some of your assumptions so that the financial savings will offset the cost?

Danielle: I'm willing to discuss my assumptions with you. Maybe I overlooked something.

Jerrod: Good. Here's what I want you to do. I see in your analysis that you don't project greater sales as a result of the warehouse. It seems to me that if we can store more goods, then we will have more to sell. Thus, logically, a larger warehouse translates into more sales. If you incorporate this into your analysis, I think you'll see that the numbers will work out. Why don't you work it through and come back with a new analysis. I'm really counting on you on this one. Let's get off to a good start together and see if we can get this project accepted.



What is your advice to Danielle?



#### CP 25-2 Personal investment analysis for a service company

A Masters of Accountancy degree at Central University costs \$12,000 for an additional fifth year of education beyond the bachelor's degree. Assume that all tuition is paid at the beginning of the year. A student considering this investment must evaluate the present value of cash flows from possessing a graduate degree versus holding only the undergraduate degree. Assume that the average student with an undergraduate degree is expected to earn an annual salary of \$50,000 per year (assumed to be paid at the end of the year) for 10 years. Assume that the average student with a graduate Masters of Accountancy degree is expected to earn an annual salary of \$66,000 per year (assumed to be paid at the end of the year) for nine years after graduation. Assume a minimum rate of return of 10%.

- 1. Determine the net present value of cash flows from an undergraduate degree. Use the present value table provided in this chapter in Exhibit 5.
- 2. Determine the net present value of cash flows from a Masters of Accountancy degree, assuming no salary is earned during the graduate year of schooling.
- ► What is the net advantage or disadvantage of pursuing a graduate degree under these assumptions?

#### CP 25-3 Changing prices

Global Electronics Inc. invested \$1,000,000 to build a plant in a foreign country. The labor and materials used in production are purchased locally. The plant expansion was estimated to produce an internal rate of return of 20% in U.S. dollar terms. Due to a currency crisis, the currency exchange rate between the local currency and the U.S. dollar doubled from two local units per U.S. dollar to four local units per U.S. dollar.

- a. Assume that the plant produced and sold product in the local economy. Explain what impact this change in the currency exchange rate would have on the project's internal rate of return.
- b. Assume that the plant produced product in the local economy but exported the product back to the United States for sale. Explain what impact the change in the currency exchange rate would have on the project's internal rate of return under this assumption.

#### CP 25-4 Qualitative issues in investment analysis

The following are some selected quotes from senior executives:

CEO, Worthington Industries (a high-technology steel company): "We try to find the best technology, stay ahead of the competition, and serve the customer.... We'll make any investment that will pay back quickly... but if it is something that we really see as a must down the road, payback is not going to be that important."

Chairman of Amgen Inc. (a biotech company): "You cannot really run the numbers, do net present value calculations, because the uncertainties are really gigantic.... You decide on a project you want to run, and then you run the numbers [as a reality check on your assumptions]. Success in a business like this is much more dependent on tracking rather than on predicting, much more dependent on seeing results over time, tracking and adjusting and readjusting, much more dynamic, much more flexible."

Chief Financial Officer of Merck & Co., Inc. (a pharmaceutical company): "... at the individual product level—the development of a successful new product requires on the order of \$230 million in R&D, spread over more than a decade—discounted cash flow style analysis does not become a factor until development is near the point of manufacturing scale-up effort. Prior to that point, given the uncertainties associated with new product development, it would be lunacy in our business to decide that we know exactly what's going to happen to a product once it gets out."

Explain the role of capital investment analysis for these companies.

#### CP 25-5 Net present value method for a service company

Metro-Goldwyn-Mayer Studios Inc. (MGM) is a major producer and distributor of theatrical and television filmed entertainment. Regarding theatrical films, MGM states, "Our feature films are exploited through a series of sequential domestic and international distribution channels, typically beginning with theatrical exhibition. Thereafter, feature films are first made available for home video (online downloads) generally six months after theatrical release; for pay television, one year after theatrical release; and for syndication, approximately three to five years after theatrical release."

Assume that MGM produces a film during early 2016 at a cost of \$340 million and releases it halfway through the year. During the last half of 2016, the film earns revenues of \$420 million at the box office. The film requires \$90 million of advertising during the release. One year later, by the end of 2017, the film is expected to earn MGM net cash flows from online downloads of \$60 million. By the end of 2018, the film is expected to earn MGM \$20 million from pay TV; and by the end of 2019, the film is expected to earn \$10 million from syndication.

- a. Determine the net present value of the film as of the beginning of 2016 if the desired rate of return is 20%. To simplify present value calculations, assume all annual net cash flows occur at the end of each year. Use the table of the present value of \$1 appearing in Exhibit 2 of this chapter. Round to the nearest whole million dollars.
- b. Under the assumptions provided here, is the film expected to be financially successful?









#### CP 25-6 Capital investment analysis

Internet Project

#### **Group Project**

In one group, find a local business, such as a copy shop, that rents time on desktop computers for an hourly rate. Determine the hourly rate. In the other group, determine the price of a mid-range desktop computer at www.dell.com. Combine this information from the two groups and perform a capital budgeting analysis. Assume that one student will use the computer for 40 hours per semester for the next three years. Also assume that the minimum rate of return is 10%. Use the interest tables in Appendix A in performing your analysis. [Hint: Use the appropriate present value of an annuity of \$1 factor for 5% compounded for six semiannual periods (periods = 6).]

Does your analysis support the student purchasing the computer?



# Cost Allocation and Activity-Based Costing

# Cold Stone Creamery

ave you ever had to request service repairs on an appliance at your home? The repair person may arrive and take five minutes to replace a part. Yet, the bill may indicate a minimum charge for more than five minutes of work.

Why might there be a minimum charge for a service call? The answer is that the service person must charge for the time and expense of coming to your house. In a sense, the bill reflects two elements of service: (1) the cost of coming to your house and (2) the cost of the repair. The first portion of the bill reflects the time required to "set up" the job. The second part of the bill reflects the cost of performing the repair. The setup charge will be the same, whether the repairs take five minutes or five hours. In contrast, the actual repair charge will vary with the time on the job.

Like the repair person, companies must be careful that the cost of their products and services accurately reflect the different activities involved in producing the product or service. Otherwise, the cost of products and services may be distorted and lead to improper management decisions.

To illustrate, **Cold Stone Creamery**, a chain of super premium ice cream shops, uses activity-based costing to determine the cost of its ice cream products, such as cones, mixings, cakes, frozen yogurt, smoothies, and sorbets. The costs of activities, such as scooping and mixing, are added to the cost of the ingredients to determine the total cost of each product. As stated by Cold Stone's president:

"... it only makes sense to have the price you pay for the product be reflective of the activities involved in making it for you."*

In this chapter, three different methods of allocating factory overhead to products are described and illustrated. In addition, product cost distortions resulting from improper factory overhead allocations are discussed. The chapter concludes by describing activity-based costing for selling and administrative expenses and its use in service businesses.

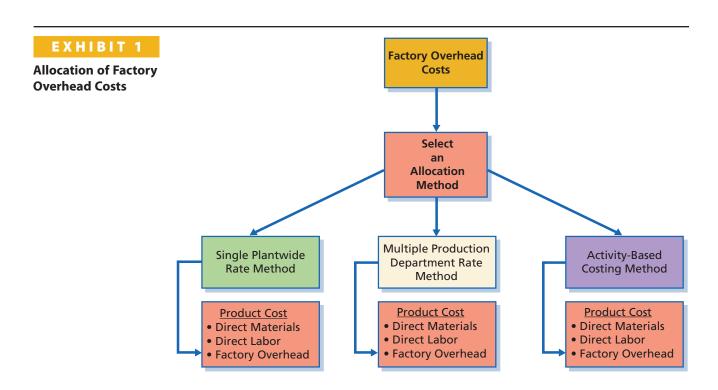
 $\hbox{``Quote from'' Experiencing Accounting Videos,'' Activity-Based Costing. $$ @ Cengage Learning, 2008. $$$ 

Learning Objectives	
After studying this chapter, you should be able to:	Example Exercises
Identify three methods used for allocating factory overhead costs to products.  Product Costing Allocation Methods	
Use a single plantwide factory overhead rate for product costing.  Single Plantwide Factory Overhead Rate Method	EE 26-1
Use multiple production department factory overhead rates for product costing.  Multiple Production Department Factory Overhead Rate Method  Department Overhead Rates and Allocation  Distortion of Product Costs	EE 26-2 EE 26-2
Use activity-based costing for product costing. Activity-Based Costing Method Activity Rates and Allocation Distortion in Product Costs Dangers of Product Cost Distortion	EE 26-3 EE 26-3 EE 26-3
Use activity-based costing to allocate selling and administrative expenses to products.  Activity-Based Costing for Selling and Administrative Expenses	EE 26-4
Use activity-based costing in a service business.  Activity-Based Costing in Service Businesses	EE 26-5
At a G	lance 26 Page 1218



## **Product Costing Allocation Methods**

Determining the cost of a product is termed **product costing**. Product costs consist of direct materials, direct labor, and factory overhead. The direct materials and direct labor are direct costs that can be traced to the product. However, factory overhead includes indirect costs that must be allocated to the product as shown in Exhibit 1.



In Chapter 17, the allocation of factory overhead using a predetermined factory overhead rate was illustrated. The most common methods of allocating factory overhead using predetermined factory overhead rates are:

- · Single plantwide factory overhead rate method
- Multiple production department factory overhead rate method
- · Activity-based costing method

The choice of allocation method is important to managers because the allocation affects the product cost, as shown in Exhibit 1. Managers are concerned about the accuracy of product costs, which are used for decisions such as determining product mix, establishing product price, and determining whether to discontinue a product line.

## Single Plantwide Factory Overhead Rate Method



A company may use a predetermined factory overhead rate to allocate factory overhead costs to products. Under the **single plantwide factory overhead rate method**, factory overhead costs are allocated to products using only one rate.

To illustrate, assume the following data for **Ruiz Company**, which manufactures snowmobiles and riding mowers in a single factory:

Total budgeted factory overhead costs for the year	\$1,600,000
Total budgeted direct labor hours (computed as follows)	20,000 hours

The total budgeted direct labor hours are computed as follows:

	Snowmobiles	<b>Riding Mowers</b>	Total
Planned production for the year	1,000 units	1,000 units	
Direct labor hours per unit	$\times 10$ hours	$\times 10$ hours	
Budgeted direct labor hours	10,000 hours	10,000 hours	20,000 hours

Under the single plantwide factory overhead rate method, the \$1,600,000 budgeted factory overhead is applied to all products by using one rate. This rate is computed as follows:

The budgeted allocation base is a measure of operating activity in the factory. Common allocation bases would include direct labor hours, direct labor dollars, and machine hours. Ruiz allocates factory overhead using budgeted direct labor hours as the plantwide allocation base. Thus, Ruiz's single plantwide factory overhead rate is \$80 per direct labor hour, computed as follows:

Single Plantwide Factory Overhead Rate = 
$$\frac{\$1,600,000}{20,000 \text{ direct labor hours}}$$
  
=  $\$80 \text{ per direct labor hours}$ 

Ruiz uses the plantwide rate of \$80 per direct labor hour to allocate factory overhead to snowmobiles and riding mowers, computed as follows:

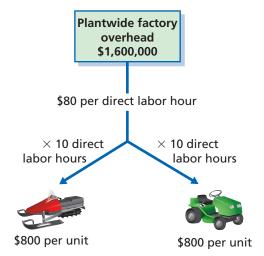
	Single Plantwide Factory Overhead Rate	×	Direct Labor Hours per Unit	=	Factory Overhead Cost per Unit
Snowmobile	\$80 per direct labor hour	×	10 direct labor hours	=	\$800
Riding mower	\$80 per direct labor hour	×	10 direct labor hours	=	\$800

The factory overhead allocated to each product is \$800. This is because each product uses the same number of direct labor hours.

The effects of Ruiz Company using the single plantwide factory overhead rate method are summarized in Exhibit 2.

#### **EXHIBIT 2**

Single Plantwide Factory Overhead Rate Method—Ruiz Company



Many military contractors use a single plantwide rate for allocating factory overhead costs to products, such as jet fighters.

The primary advantage of using the single plantwide overhead rate method is that it is simple and inexpensive to use. However, the single plantwide rate assumes that the factory overhead costs are consumed in the same way by all products. For example, in the preceding illustration Ruiz assumes that factory overhead costs are consumed as each direct labor hour is incurred.

The preceding assumption may be valid for companies that manufacture one or a few products. However, if a company manufactures products that consume factory overhead costs in different ways, a single plantwide rate may not accurately allocate factory overhead costs to the products.

### Example Exercise 26-1 Single Plantwide Factory Overhead Rate



The total factory overhead for Morris Company is budgeted for the year at \$650,000. Morris manufactures two office furniture products: a credenza and desk. The credenza and desk each require four direct labor hours (dlh) to manufacture. Each product is budgeted for 5,000 units of production for the year. Determine (a) the total number of budgeted direct labor hours for the year, (b) the single plantwide factory overhead rate, and (c) the factory overhead allocated per unit for each product using the single plantwide factory overhead rate.

#### Follow My Example 26-1

- a. Credenza: 5,000 units  $\times$  4 direct labor hours = 20,000 direct labor hours Desk: 5,000 units  $\times$  4 direct labor hours =  $\frac{20,000}{40,000}$  direct labor hours
- b. Single plantwide factory overhead rate:  $$650,000 \div 40,000 \text{ dlh} = $16.25 \text{ per dlh}$
- c. Credenza: \$16.25 per direct labor hour  $\times$  4 dlh per unit = \$65 per unit Desk: \$16.25 per direct labor hour  $\times$  4 dlh per unit = \$65 per unit

Practice Exercises: PE 26-1A, PE 26-1B

## Integrity, Objectivity, and Ethics in Business



#### **FRAUD AGAINST YOU AND ME**

The U.S. government makes a wide variety of purchases. Two of the largest are health care purchases under Medicare and military equipment. The purchase price for these and other items is often determined by the cost plus some profit. The cost is often the sum of direct costs plus allocated overhead. Due to the complexity of determining cost, government agencies review the amount charged for products and services. In the event of disagreement between the contractor and the government, the

U.S. government may sue the contractor under the False Claims Act, which provides for three times the government's damages plus civil penalties. In 2013, the U.S. Department of Justice recovered \$3.8 billion from false claims acts. Of this amount, \$2.6 billion involved health care frauds. Most of the cases were the result of allegations by private citizens under the act's whistleblower provision.

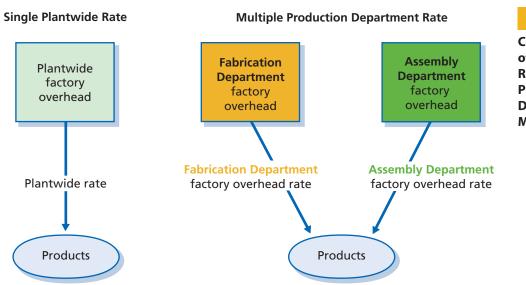
Source: *Top 20 Cases*, The False Claims Act Legal Center of the TAF Education Fund, www.taf.org.

# **Multiple Production Department Factory Overhead Rate Method**

Use multiple production department factory overhead rates for product costing.

When production departments *differ significantly* in their manufacturing processes, factory overhead costs are normally incurred differently in each department. In such cases, factory overhead costs may be more accurately allocated using multiple production department factory overhead rates.

The multiple production department factory overhead rate method uses different rates for each production department to allocate factory overhead costs to products. In contrast, the single plantwide rate method uses only one rate to allocate factory overhead costs. Exhibit 3 illustrates how these two methods differ.



#### EXHIBIT 3

Comparison
of Single Plantwide
Rate and Multiple
Production
Department Rate
Methods

To illustrate the multiple production department factory overhead rate method, the prior illustration for **Ruiz Company** is used. In doing so, assume that Ruiz uses the following two production departments in the manufacture of snowmobiles and riding mowers:

- Fabrication Department, which cuts metal to the shape of the product.
- Assembly Department, which manually assembles machined pieces into a final product.

The total budgeted factory overhead for Ruiz is \$1,600,000 divided into the Fabrication and Assembly departments as follows:¹

Factory overhead costs are assigned to production departments using methods discussed in advanced cost accounting textbooks.

	Overhead Costs
Fabrication Department	\$1,030,000
Assembly Department	570,000
Total budgeted factory overhead costs	\$1,600,000

**Budgeted Factory** 

As illustrated, the Fabrication Department incurs nearly twice the factory overhead of the Assembly Department. This is because the Fabrication Department has more machinery and equipment that uses more power, incurs more equipment depreciation, and uses more factory supplies.

### **Department Overhead Rates and Allocation**

Each production department factory overhead rate is computed as follows:

 $\frac{\text{Production Department}}{\text{Factory Overhead Rate}} = \frac{\text{Budgeted Department Factory Overhead}}{\text{Budgeted Department Allocation Base}}$ 

To illustrate, assume that **Ruiz Company** uses direct labor hours as the allocation base for the Fabrication and Assembly departments.² Each department uses 10,000 direct labor hours. Thus, the factory overhead rates are as follows:

Fabrication Department Factory Overhead Rate  $= \frac{\$1,030,000}{10,000 \text{ direct labor hours}} = \$103 \text{ direct labor hours}$ Assembly Department Factory Overhead Rate  $= \frac{\$570,000}{10,000 \text{ direct labor hours}} = \$57 \text{ direct labor hours}$ 

Ten direct labor hours are required for the manufacture of each snowmobile and riding mower. These 10 hours are consumed in the Fabrication and Assembly departments as follows:

	Snowmobile	Riding Mower
Fabrication Department	8 hours	2 hours
Assembly Department	_2	_8
Direct labor hours per unit	10 hours	10 hours

The factory overhead allocated to each snowmobile and riding mower is shown in Exhibit 4. As shown in Exhibit 4, each snowmobile is allocated \$938 of total factory

#### **EXHIBIT 4**

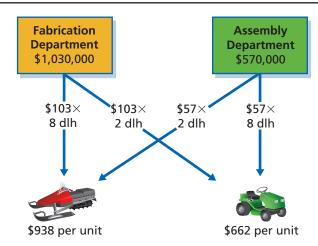
#### Allocating Factory Overhead to Products—Ruiz Company

		Allocation Base Usage per Unit	×	Production Department Factory Overhead Rate	=	Allocated Factory Overhead per Unit of Product
	Snowmobile					<u> </u>
	Fabrication Department	8 direct labor hours	$\times$	\$103 per dlh	=	\$824
	Assembly Department  Total factory overhead cost	2 direct labor hours	×	\$ 57 per dlh	=	114
	per snowmobile					\$938
	Riding mower					
9	Fabrication Department	2 direct labor hours	$\times$	\$103 per dlh	=	\$206
	Assembly Department Total factory overhead cost	8 direct labor hours	×	\$ 57 per dlh	=	456
	per riding mower					\$662

²Departments need not use the same allocation base. The allocation base should be associated with the operating activity of the department.

overhead costs. In contrast, each riding mower is allocated \$662 of factory overhead costs.

Exhibit 5 summarizes the multiple production department rate allocation method for Ruiz. Exhibit 5 indicates that the Fabrication Department factory overhead rate is \$103 per direct labor hour, while the Assembly Department rate is \$57 per direct labor hour. Since the snowmobile uses more Fabrication Department direct labor hours than does the riding mower, the total overhead allocated to each snowmobile is \$276 greater (\$938 – \$662) than the amount allocated to each riding mower.



#### **EXHIBIT 5**

Multiple Production Department Rate Method—Ruiz Company

### **Distortion of Product Costs**

The differences in **Ruiz Company**'s factory overhead for each snowmobile and riding mower using the single plantwide and the multiple production department factory overhead rate methods are as follows:

Factory	Overh	aad C	ost n	ar I Init

	Single Plantwide Method	Multiple Production Department Method	Difference
Snowmobile	\$800	\$938	\$(138)
Riding mower	800	662	138

The single plantwide factory overhead rate distorts the product cost of both the snowmobile and riding mower. That is, the snowmobile is not allocated enough cost and, thus, is undercosted by \$138. In contrast, the riding mower is allocated too much cost and is overcosted by \$138 (\$800 - \$662).

The preceding cost distortions are caused by averaging the differences between the high factory overhead costs in the Fabrication Department and the low factory overhead costs in the Assembly Department. Using the single plantwide rate, it is assumed that all factory overhead is directly related to a single allocation base for the entire plant. This assumption is not realistic for Ruiz. Thus, using a single plantwide rate distorted the product costs of snowmobiles and riding mowers.

The following conditions indicate that a single plantwide factory overhead rate may cause product cost distortions:

- Condition 1: Differences in production department factory overhead rates. Some departments have high rates, whereas others have low rates.
- Condition 2: Differences among products in the ratios of allocation base usage within a department and across departments. Some products have a

#### Note:

The single plantwide factory overhead rate distorts product cost by averaging high and low factory overhead costs.

high ratio of allocation base usage within departments, whereas other products have a low ratio of allocation base usage within the same departments.

To illustrate, Condition 1 exists for Ruiz because the factory overhead rate for the Fabrication Department is \$103 per direct labor hour, whereas the rate for the Assembly Department is only \$57 per direct labor hour. However, this condition by itself will not cause product cost distortions.

Condition 2 also exists for Ruiz. The snowmobile consumes eight direct labor hours in the Fabrication Department, whereas the riding mower consumes only two direct labor hours. Thus, the ratio of allocation base usage is 4:1 in the Fabrication Department, computed as follows:³

```
Ratio of Allocation Base Usage in the Fabrication Department = \frac{\text{Direct Labor Hours for snowmobiles}}{\text{Direct Labor Hours for riding mowers}} = \frac{8 \text{ hours}}{2 \text{ hours}} = 4:
```

In contrast, the ratio of allocation base usage is 1:4 in the Assembly Department, computed as follows:

```
Ratio of Allocation Base Usage in the Fabrication Department = \frac{\text{Direct Labor Hours for snowmobiles}}{\text{Direct Labor Hours for riding mowers}} = \frac{2 \text{ hours}}{8 \text{ hours}} = 1:4
```

Because both conditions exist for Ruiz, the product costs from using the single plantwide factory overhead rate are distorted. The preceding conditions and the resulting product cost distortions are summarized in Exhibit 6.

#### **EXHIBIT 6 Conditions for Product Cost Distortion—Ruiz Company Fabrication** Assembly Department **Department** \$103 per \$57 per **Condition 1:** Differences direct direct in production department labor hour labor hour factory overhead rates 2 direct 8 direct labor hours labor Condition 2: Differences hours in the ratios of allocation base usage 2 direct 8 direct labor hours labor hours Ratio of Ratio of **Allocation Base** Allocation Base Usage = 4:1Usage =1:4

³ The numerator and denominator could be switched as long as the ratio is computed the same for each department. This is because the objective is to compare whether differences exist in the ratio of allocation base usage across products and departments.

#### Example Exercise 26-2 Multiple Production Department Factory Overhead Rates



The total factory overhead for Morris Company is budgeted for the year at \$600,000 and divided into two departments: Fabrication, \$420,000 and Assembly, \$180,000. Morris manufactures two office furniture products: credenzas and desks. Each credenza requires one direct labor hour (dlh) in Fabrication and three direct labor hours in Assembly. Each desk requires three direct labor hours in Fabrication and one direct labor hour in Assembly. Each product is budgeted for 5,000 units of production for the year. Determine (a) the total number of budgeted direct labor hours for the year in each department, (b) the departmental factory overhead rates for both departments, and (c) the factory overhead allocated per unit for each product, using the department factory overhead allocation rates.

#### Follow My Example 26-2

- a. Fabrication: (5,000 credenzas  $\times$  1 dlh) + (5,000 desks  $\times$  3 dlh) = 20,000 direct labor hours Assembly: (5,000 credenzas  $\times$  3 dlh) + (5,000 desks  $\times$  1 dlh) = 20,000 direct labor hours
- b. Fabrication Department rate:  $$420,000 \div 20,000$  direct labor hours = \$21.00 per dlh Assembly Department rate:  $$180,000 \div 20,000$  direct labor hours = \$9.00 per dlh
- c. Credenza:

Desk:

Practice Exercises: PE 26-2A, PE 26-2B

## **Activity-Based Costing Method**



As illustrated in the preceding section, product costs may be distorted when a single plantwide factory overhead rate is used. However, product costs may also be distorted when multiple production department factory overhead rates are used. Activity-based costing further reduces the possibility of product cost distortions.

The **activity-based costing (ABC) method** provides an alternative approach for allocating factory overhead that uses multiple factory overhead rates based on different activities. **Activities** are the types of work, or actions, involved in a manufacturing or service process. For example, the assembly, inspection, and engineering design functions are activities that might be used to allocate overhead.

Under activity-based costing, factory overhead costs are initially budgeted for activities, sometimes called *activity cost pools*, such as machine usage, inspections, moving, production setups, and engineering activities.⁴ In contrast, when multiple production department factory overhead rates are used, factory overhead costs are first accounted for in production departments.

Exhibit 7 illustrates how activity-based costing differs from the multiple production department method.

⁴The activity rate is based on budgeted activity costs. Activity-based budgeting and the reconciliation of budgeted activity costs to actual costs are topics covered in advanced texts.

#### **EXHIBIT 7** Multiple Production Department Factory Overhead Rate Method vs. Activity-Based Costing **Multiple Production Department Activity-Based Costing Factory Overhead Rate Method** Production Production Activity Activity Activity Activity Activity Department Department **Factory Overhead Factory Overhead Production Department Rates Activity Rates Products Products**

To illustrate the activity-based costing method, the prior illustration for **Ruiz Company** is used. Assume that the following activities have been identified for producing snowmobiles and riding mowers:

- Fabrication, which consists of cutting metal to shape the product. This activity is machine-intensive.
- Assembly, which consists of manually assembling machined pieces into a final product.
   This activity is labor-intensive.
- Setup, which consists of changing tooling in machines in preparation for making a new product. Each production run requires a setup.
- *Quality-control inspections*, which consist of inspecting the product for conformance to specifications. Inspection requires product tear down and reassembly.
- Engineering changes, which consist of processing changes in design or process specifications for a product. The document that initiates changing a product or process is called an engineering change order (ECO).

Fabrication and assembly are now identified as *activities* rather than *departments*. As a result, the setup, quality-control inspections, and engineering change functions that were previously allocated to the Fabrication and Assembly departments are now classified as separate activities.

The budgeted cost for each activity is as follows:

Activity	Budgeted Activity Cost
Fabrication	\$ 530,000
Assembly	70,000
Setup	480,000
Quality-control inspections	312,000
Engineering changes	208,000
Total budgeted activity costs	\$1,600,000

The costs for the fabrication and assembly activities are less than the costs shown in the preceding section where these activities were identified as production departments. This is because the costs of setup, quality-control inspections, and engineering changes, which total \$1,000,000 (\$480,000 + \$312,000 + \$208,000), have now been separated into their own activity cost pools.

## **Activity Rates and Allocation**

The budgeted activity costs are assigned to products using factory overhead rates for each activity. These rates are called **activity rates** because they are related to activities. Activity rates are computed as follows:

$$\mbox{Activity Rate} = \frac{\mbox{Budgeted Activity Cost}}{\mbox{Total Activity-Base Usage}}$$

The term **activity base**, rather than *allocation base*, is used because the base is related to an activity.

To illustrate, assume that snowmobiles are a new product for **Ruiz Company**, and engineers are still making minor design changes. Ruiz has produced riding mowers for many years. Activity-base usage for the two products are as follows:

#### Note:

Activity rates are computed by dividing the budgeted activity cost pool by the total estimated activity-base usage.

	Snowmobile	Riding Mower
Estimated units of total		
production	1,000 units	1,000 units
Estimated setups	100 setups	20 setups
Quality-control inspections Estimated engineering	100 inspections (10%)	4 inspections (0.4%)
change orders	12 change orders	4 change orders

The number of direct labor hours used by each product is 10,000 hours, computed as follows:

	Direct Labor Hours per Unit	Number of Units of Production	Total Direct Labor Hours
Snowmobile:			
Fabrication Department	8 hours	1,000 units	8,000 hours
Assembly Department	2 hours	1,000 units	_2,000 hours
Total			10,000 hours
Riding Mower:			
Fabrication Department	2 hours	1,000 units	2,000 hours
Assembly Department	8 hours	1,000 units	<u>8,000</u> hours
Total			10,000 hours

Exhibit 8 summarizes the activity-base usage quantities for each product.

#### **EXHIBIT 8**

#### **Activity Bases—Ruiz Company**

			Activity-Base	Usage	
Products Fabrication Assembly		Setup	Quality-Control Engineer Inspections Chang		
Snowmobile	8,000 dlh	2,000 dlh	100 setups	100 inspections	12 ECOs
Riding mower	2,000	8,000	_20	4	_4
Total activity-base usage	10,000 dlh	10,000 dlh	120 setups	104 inspections	16 ECOs

The activity rates for Ruiz are shown in Exhibit 9.

#### **EXHIBIT 9**

#### **Activity Rates—Ruiz Company**

Activity	Budgeted Activity Cost	÷	Total Activity-Base Usage	=	Activity Rate
Fabrication	\$530,000	÷	10,000 direct labor hours	=	\$53 per direct labor hour
Assembly	\$ 70,000	÷	10,000 direct labor hours	=	\$7 per direct labor hour
Setup	\$480,000	÷	120 setups	=	\$4,000 per setup
Quality-control inspections	\$312,000	÷	104 inspections	=	\$3,000 per inspection
Engineering changes	\$208,000	÷	16 engineering changes	=	\$13,000 per engineering change order

The factory overhead cost per unit is computed as follows:

Activity-Base Usage × Activity Rate Total Units of Estimated Production

or

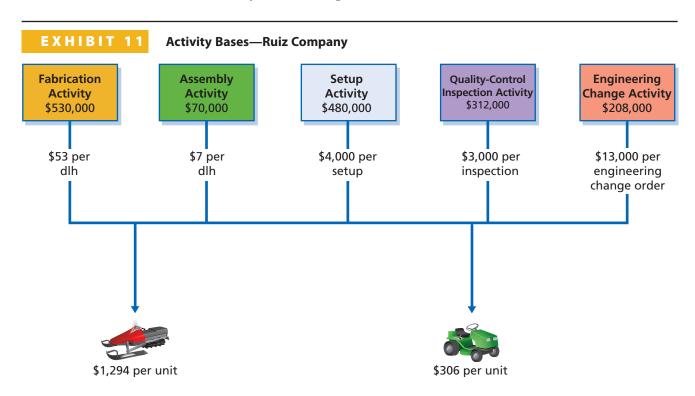
Total Factory Overhead Cost
Total Units of Estimated Production

These computations for Ruiz's snowmobile and riding mower are shown in Exhibit 10.

#### **EXHIBIT 10** Activity-Based Product Cost Calculations

	Α	В	C	D	Е	F	G	Н	Ι	J	K	L
1		Snowmobile Riding Mower										
2		Activity-Base		Activity		Activity		Activity-Base		Activity		Activity
3	Activity	Usage	×	Rate	=	Cost		Usage	×	Rate		Cost
4												
5	Fabrication	8,000 dlh		\$53/dlh		\$ 424,000		2,000 dlh		\$53/dlh		\$106,000
6	Assembly	2,000 dlh		\$7/dlh		14,000		8,000 dlh		\$7/dlh		56,000
7	Setup	100 setups		\$4,000/setup		400,000		20 setups		\$4,000/setup		80,000
8	Quality-control											
9	inspections	100 inspections		\$3,000/insp.		300,000		4 inspections		\$3,000/insp.		12,000
10	Engineering											
11	changes	12 ECOs		\$13,000/ECO		156,000		4 ECOs		\$13,000/ECO		52,000
12	Total factory											
13	overhead cost					\$1,294,000						\$306,000
14	Budgeted units											
15	of production					1,000						1,000
16	Factory overhead											
17	cost per unit					\$ 1,294						\$ 306

The activity-based costing method for Ruiz is summarized in Exhibit 11.



#### **Distortion in Product Costs**

The factory overhead costs per unit for **Ruiz Company** using the three allocation methods are shown in Exhibit 12.

#### EXHIBIT 12

#### **Overhead Cost Allocation Methods: Ruiz Company**

		Factory Overhead Cost per Unit— Three Cost Allocation Methods	
	Single Plantwide Rate	Multiple Production Department Rates	Activity-Based Costing
nowmobile	\$800	\$938	\$1,294
Riding mower	800	662	306

The activity-based costing method produces different factory overhead costs per unit (product costs) than the multiple department factory overhead rate method. This difference is caused by how the \$1,000,000 of setup, quality control, and engineering change activities are allocated.

Under the multiple production department factory overhead rate method, setup, quality control, and engineering change costs were allocated using departmental rates based on direct labor hours. However, snowmobiles and riding mowers did *not* consume these *activities* in proportion to direct labor hours. That is, each snowmobile consumed a larger portion of the setup, quality-control inspection, and engineering change activities. This was true even though each product consumed 10,000 direct labor hours. As a result, activity-based costing allocated more of the cost of these activities to the snowmobile. Only under the activity-based approach were these differences reflected in the factory overhead cost allocations and thus in the product costs.

## **Dangers of Product Cost Distortion**

If **Ruiz Company** used the \$800 factory overhead cost allocation (single plantwide rate) instead of activity-based costing for pricing snowmobiles and riding mowers, the following would likely result:

- The snowmobile would be *underpriced* because its factory overhead cost would be understated by \$494 (\$1,294 \$800).
- The riding mower would be overpriced because its factory overhead cost would be overstated by \$494 (\$800 – \$306).

As a result, Ruiz would likely lose sales of riding mowers because they are overpriced. In contrast, sale of snowmobiles would increase because they are underpriced. Due to these pricing errors, Ruiz might incorrectly decide to expand production of snowmobiles and discontinue making riding mowers.

If Ruiz uses the activity-based costing method, its product costs would be more accurate. Thus, Ruiz would have a better starting point for making proper pricing decisions. Although the product cost distortions are not as great, similar results would occur if Ruiz had used the multiple production department rate method.



ArvinMeritor, Inc., discovered that incorrect

factory overhead cost allocations had "overcosted" some of its products by roughly 20%. As a result, these products were overpriced and began losing market share.

#### Example Exercise 26-3 Activity-Based Costing: Factory Overhead Costs



The total factory overhead for Morris Company is budgeted for the year at \$600,000, divided into four activities: fabrication, \$300,000; assembly, \$120,000; setup, \$100,000; and materials handling, \$80,000. Morris manufactures two office furniture products: a credenza and desk. The activity-base usage quantities for each product by each activity are estimated as follows:

	Fabrication	Assembly	Setup	Materials Handling
Credenza	5,000 dlh	15,000 dlh	30 setups	50 moves
Desk	15,000	5,000	220	<u>350</u>
Total activity-base usage	20,000 dlh	20,000 dlh	250 setups	400 moves

Each product is budgeted for 5,000 units of production for the year. Determine (a) the activity rates for each activity and (b) the activity-based factory overhead per unit for each product.

#### Follow My Example 26-3

a. Fabrication:	\$300,000 ÷ 20,000 direct labor ho	urs = \$15 per dlh
Assembly:	\$120,000 ÷ 20,000 direct labor ho	urs = \$6 per dlh
Setup:	\$100,000 ÷ 250 setups	= \$400 per setup
Materials handling:	\$80,000 ÷ 400 moves	= \$200 per move

	А	В	C	D	E	F	G	Н	П	J	K	L
1			Credenza				Desk					
2		Activity-Base		Activity		Activity		Activity-Base		Activity		Activity
3	Activity	Usage	×	Rate	=	Cost		Usage	×	Rate		Cost
4												
5	Fabrication	5,000 dlh		\$15 per dlh		\$ 75,000		15,000 dlh		\$15 per dlh		\$225,000
6	Assembly	15,000 dlh		\$6 per dlh		90,000		5,000 dlh		\$6 per dlh		30,000
7	Setup	30 setups		\$400/setup		12,000		220 setups		\$400/setup		88,000
8	Materials handling	50 moves		\$200/move		10,000		350 moves		\$200/move		70,000
9	Total					\$187,000						\$413,000
10	Budgeted units					÷ 5,000						÷ 5,000
11	Factory overhead											
12	per unit					\$ 37.40						\$ 82.60

Practice Exercises: PE 26-3A, PE 26-3B

Use activitybased costing to allocate selling and administrative expenses to products.

# **Activity-Based Costing for Selling and Administrative Expenses**

Generally accepted accounting principles (GAAP) require that selling and administrative expenses be reported as period expenses on the income statement. However, selling and administrative expenses may be allocated to products for managerial decision making. For example, selling and administrative expenses may be allocated for analyzing product profitability.

One method of allocating selling and administrative expenses to the products is based on sales volumes. However, products may consume activities in ways that are unrelated to their sales volumes. When this occurs, activity-based costing may be a more accurate method of allocation.

To illustrate, assume that Abacus Company has two products, Ipso and Facto. Both products have the same total sales volume. However, Ipso and Facto consume selling and administrative activities differently, as shown in Exhibit 13.

If Abacus's selling and administrative expenses are allocated on the basis of sales volumes, the same amount of expense would be allocated to Ipso and Facto. This is

Selling and Administrative Activities	lpso	Facto
Post-sale technical support	Product is easy to use by the customer.	Product requires specialized training in order to be used by the customer.
Order writing	Product requires no technical informationfrom the customer.	Product requires detailed technical information from the customer.
Promotional support	Product requires no promotional effort.	Product requires extensive promotional effort.
Order entry	Product is purchased in large volumes per order.	Product is purchased in small volumes per order.
Customer return processing	Product has few customer returns.	Product has many customer returns.
Shipping document preparation	Product is shipped domestically.	Product is shipped internationally, requiring customs and export documents.
Shipping and handling	Product is not hazardous.	Product is hazardous, requiring specialized shipping and handling.
Field service	Product has few warranty claims.	Product has many warranty claims.

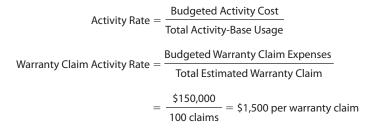
#### **EXHIBIT 13**

Selling and Administrative Activity Product Differences

because Ipso and Facto have the same sales volume. However, as Exhibit 13 implies, such an allocation would be misleading.

The activity-based costing method can be used to allocate the selling and administrative activities to Ipso and Facto. Activity-based costing allocates selling and administrative expenses based on how each product consumes activities.

To illustrate, assume that Abacus's field warranty service activity has a budgeted cost of \$150,000. Additionally, assume that 100 warranty claims are estimated for the period. Using warranty claims as an activity base, the warranty claim activity rate is \$1,500, computed as follows:



Assuming that Ipso had 10 warranty claims and Facto had 90 warranty claims, the field service activity expenses would be allocated to each product as follows:

lpso: 10 warranty claims  $\times$  \$1,500 per warranty claim = \$ 15,000 Facto: 90 warranty claims  $\times$  \$1,500 per warranty claim = \$135,000

The remaining selling and administrative activities could be allocated to Ipso and Facto in a similar manner.



In some cases, selling and administrative expenses may be more related to *customer* behaviors than to differences in products. That is, some customers may demand more service and selling activities than other customers. In such cases, activity-based costing would allocate selling and administrative expenses to customers.

# Example Exercise 26-4 Activity-Based Costing: Selling and Administrative Expenses



Converse Company manufactures and sells LCD display products. Converse uses activity-based costing to determine the cost of the customer return processing and the shipping activity. The customer return processing activity has an activity rate of \$90 per return, and the shipping activity has an activity rate of \$15 per shipment. Converse shipped 4,000 units of LCD Model A1 in 2,200 shipments (some shipments are more than one unit). There were 200 returns. Determine the (a) total and (b) per-unit customer return processing and shipping activity cost for Model A1.

.....

#### Follow My Example 26-4

- a. Return activity: 200 returns  $\times$  \$90 per return = \$18,000 Shipping activity: 2,200 shipments  $\times$  \$15 per shipment = 33,000 Total activity cost \$51,000
- b. \$12.75 per unit (\$51,000 ÷ 4,000 units)

Practice Exercises: PE 26-4A, PE 26-4B





## **Activity-Based Costing in Service Businesses**

Service companies need to determine the cost of their services so that they can make pricing, promoting, and other decisions. The use of single and multiple department overhead rate methods may lead to distortions similar to those of manufacturing firms. Thus, many service companies use activity-based costing for determining the cost of services.

To illustrate, assume that Hopewell Hospital uses activity-based costing to allocate hospital overhead to patients. Hopewell applies activity-based costing as follows:

- · Step 1. Identifying activities.
- Step 2. Determining activity rates for each activity.
- Step 3. Allocating overhead costs to patients based upon activity-base usage.

Hopewell has identified the following activities:

- Admission
- Radiological testing
- Operating room
- · Pathological testing
- Dietary and laundry

Each activity has an estimated patient activity-base usage. Based on the budgeted costs for each activity and related estimated activity-base usage, the activity rates shown in Exhibit 14 were developed.

To illustrate, assume the following data for radiological testing:

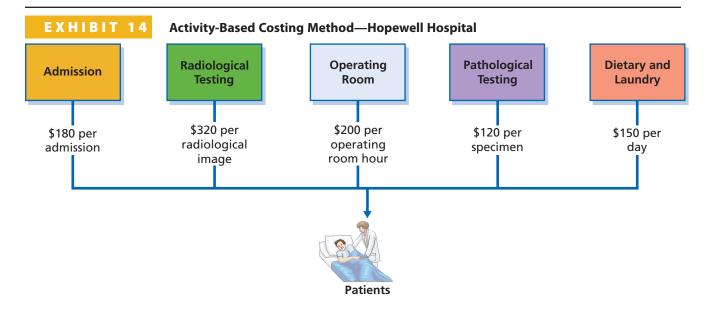
 Budgeted costs
 \$960,000

 Total estimated activity-base usage
 3,000 images

The activity rate of \$320 per radiological image is computed as follows:

 $\mbox{Activity Rate} = \frac{\mbox{Budgeted Activity Cost}}{\mbox{Total Activity-Base Usage}}$ 

Radiological Testing Activity Rate = 
$$\frac{\text{Budgeted Radiological Testing}}{\text{Total Estimated Images}}$$
$$= \frac{\$960,000}{3,000 \text{ images}} = \$320 \text{ per image}$$



The activity rates for the other activities are determined in a similar manner. These activity rates along with the patient activity-base usage are used to allocate costs to patients as follows:

 $\mbox{Activity Cost Allocated to Patient} = \mbox{Patient Activity-Base Usage} \times \mbox{Activity Rate}$ 

To illustrate, assume that Mia Wilson was a patient of the hospital. The hospital overhead services (activities) performed for Mia Wilson were as follows:

## Patient (Mia Wilson) Activity-Base Usage

Admission	1 admission
Radiological testing	2 images
Operating room	4 hours
Pathological testing	1 specimen
Dietary and laundry	7 days

## Service



## **Focus**

# UNIVERSITY AND COMMUNITY PARTNERSHIP—LEARNING YOUR ABC'S

Students at Harvard's **Kennedy School of Government** joined with the city of Somerville, Massachusetts, in building an activity-based cost system for the city. The students volunteered several hours a week in four-person teams, interviewing city officials within 18 departments. The students were able to determine activity costs, such as the cost to fill a pothole, processing a building permit, or

responding to a four-alarm fire. Their study was used by the city in forming the city budget. As stated by some of the students participating on this project: "It makes sense to use the resources of the university for community building. . . . Real-world experience is a tremendous thing to have in your back pocket. We learned from the mayor and the fire chief, who are seasoned professionals in their own right."

Source: Kennedy School Bulletin, Spring 2005, "Easy as A-B-C: Students Take on the Somerville Budget Overhaul."

Based on the preceding services (activities), the Hopewell Hospital overhead costs allocated to Mia Wilson total \$2,790, as computed in Exhibit 15.

#### **EXHIBIT 15**

**Hopewell Hospital Overhead Costs** Allocated to Mia Wilson

	А	В	С	D	Ε	F				
1	Patient Name: Mia Wilson									
2	Activity-Base Activity			Activity						
3	Activity	Activity Usage		Rate	=	Cost				
4										
5	Admission	1 admission		\$180/admission		\$ 180				
6	Radiological testing	2 images		\$320/image		640				
7	Operating room	4 hours		\$200/hour		800				
8	Pathological testing	1 specimen		\$120/specimen		120				
9	Dietary and laundry	7 days		\$150/day		1,050				
10	Total					\$2,790				

The patient activity costs can be combined with the direct costs, such as drugs and supplies. These costs and the related revenues can be reported for each patient in a patient (customer) profitability report. A partial patient profitability report for Hopewell is shown in Exhibit 16.

#### EXHIBIT 16

Customer **Profitability** Report—Hopewell Hospital

Hopewell Hospital Patient (Customer) Profitability Report For the Period Ending December 31								
	Adcock, Aesha	Birini, Sergey	Diaz, Mateo	((	Wilson, Mia			
Revenues Less patient costs:	\$9,500	\$21,400	\$5,050		\$3,300			
Drugs and supplies	\$ 400	\$ 1,000	\$ 300		\$ 200			
Admission	180	180	180		180			
Radiological testing	1,280	2,560	1,280	( (	640			
Operating room	2,400	6,400	1,600		800			
Pathological testing	240	600	120	))	120			
Dietary and laundry	4,200	14,700	1,050	( (	1,050			
Total patient costs	\$8,700	\$25,440	\$4,530		\$2,990			
Income from operations	\$ 800	\$ (4,040)	\$ 520	//	\$ 310			

Exhibit 16 can be used by hospital administrators for decisions on pricing or services. For example, there was a large loss on services provided to Sergey Birini. Investigation might reveal that some of the services provided to Birini were not reimbursed by insurance. As a result, Hopewell might lobby the insurance company to reimburse these services or request higher insurance reimbursement on other services.

## Example Exercise 26-5 Activity-Based Costing for a Service Business



The Metro Radiology Clinic uses activity-based costing to determine the cost of servicing patients. There are three activities: patient administration, imaging, and diagnostic services. The activity rates associated with each activity are \$45 per patient visit, \$320 per X-ray image, and \$450 per diagnosis. Filipa Valdez went to the clinic and had two X-rays, each of which was read and interpreted by a doctor. Determine the total activity-based cost of Valdez's visit.

#### Follow My Example 26-5

Patient administration	45	(1 visit × \$45)
Imaging	\$ 640	(2 images $\times$ \$320)
Diagnosis	900	(2 diagnoses $\times$ \$450)
Total activity cost		

Practice Exercises: PE 26-5A, PE 26-5B



## 

#### FINDING THE RIGHT NICHE

Businesses often attempt to divide a market into its unique characteristics, called market segmentation. Once a market segment is identified, product, price, promotion, and location strategies are tailored to fit that market. This is a better approach for many products and services than following a "one size fits all" strategy. Activity-based costing can be used to help tailor organizational effort toward different segments. For example, Fidelity Investments uses activity-based costing to tailor its sales and marketing strategies to different wealth segments. Thus, a higher wealth segment could rely on personal sales activities, while less wealthy segments would rely on less costly sales activities, such as mass mail. Popular forms of segmentation and their common characteristics follow:

Form of Segmentation	Characteristics				
Demographic	Age, education, gender, income, race				
Geographic	Region, city, country				
Psychographic	Lifestyle, values, attitudes				
Benefit	Benefits provided				
Volume	Light vs. heavy use				

Examples for each of these forms of segmentation are as follows:

- Demographic: Fidelity Investments tailors sales and marketing strategies to different wealth segments.
- Geographic: Pro sports teams offer merchandise in their home cities.
- Psychographic: The Body Shop markets all-natural beauty products to consumers who value cosmetic products that have not been animal-tested.
- Benefit: Cold Stone Creamery sells a premium ice cream product with customized toppings.
- Volume: Delta Air Lines provides additional benefits, such as class upgrades, free air travel, and boarding priority, to its frequent fliers.

# At a Glance 26



#### Identify three methods used for allocating factory costs to products.

**Key Points** Three cost allocation methods used for determining product costs are the (1) single plantwide factory overhead rate method, (2) multiple production department rate method, and (3) activity-based costing method.

Learning Outcome	Example Exercises	Practice Exercises
<ul> <li>List the three methods for allocating factory overhead costs to products.</li> </ul>		



#### Use a single plantwide factory overhead rate for product costing.

**Key Points** A single plantwide factory overhead rate can be used to allocate all plant overhead to all products. The single plantwide factory overhead rate is simple to apply, but can lead to product cost distortions.

Compute the single plantwide factory overhead rate and use it to allocate factory overhead costs to products.	Example Exercises EE26-1	Practice Exercises PE26-1A, 26-1B
<ul> <li>Identify the conditions that favor the use of a single plantwide factory overhead rate for allocating factory overhead costs to products.</li> </ul>		



#### Use multiple production department factory overhead rates for product costing.

**Key Points** Product costing using multiple production department factory overhead rates requires identifying the factory overhead by each production department. Using these rates can result in greater accuracy than using single plantwide factory overhead rates when:

- 1. There are significant differences in the factory overhead rates across different production departments.
- 2. The products require different ratios of allocation-base usage in each production department.

Compute multiple production department overhead rates and use these rates to allocate factory overhead costs to products.	Example Exercises EE26-2	Practice Exercises PE26-2A, 26-2B
<ul> <li>Identify and describe the two conditions that favor the use of multiple production department factory overhead rates for allocating factory overhead costs to products as compared to the single plantwide factory overhead rate method.</li> </ul>		



#### Use activity-based costing for product costing.

**Key Points** Activity-based costing requires factory overhead to be budgeted to activities. The budgeted activity costs are allocated to products by multiplying activity rates by the activity-base quantity consumed for each product. Activity-based costing is more accurate when products consume activities in proportions unrelated to plantwide or departmental allocation bases.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Compute activity rates and use these rates to allocate factory overhead costs to products.</li> </ul>	EE26-3	PE26-3A, 26-3B
<ul> <li>Identify the conditions that favor the use of activity- based rates for allocating factory overhead costs to products, as compared to the other two methods of cost allocation.</li> </ul>		
<ul> <li>Compare the three factory overhead allocation methods and describe the causes of cost allocation distortion.</li> </ul>		



#### Use activity-based costing to allocate selling and administrative expenses to products.

**Key Points** Selling and administrative expenses can be allocated to products for management profit reporting, using activity-based costing. Activity-based costing would be preferred when the products use selling and administrative activities in ratios that are unrelated to their sales volumes.

<ul> <li>Compute selling and administrative activity rates and use these rates to allocate selling and administrative expenses to either a product or customer.</li> </ul>	Example Exercises EE26-4	Practice Exercises PE26-4A, 26-4B
<ul> <li>Identify the conditions that would favor the use of activity-based costing for allocating selling and adminis- trative expenses.</li> </ul>		



#### Use activity-based costing in a service business.

**Key Points** Activity-based costing may be applied in service settings to determine the cost of individual service offerings. Service costs are determined by multiplying activity rates by the amount of activity-base quantities consumed by the customer using the service offering.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Compute activity rates for service offerings and use these rates to allocate indirect costs to either a service product line or a customer.</li> </ul>	EE26-5	PE26-5A, 26-5B
<ul> <li>Prepare a customer profitability report using the cost of activities.</li> </ul>		
<ul> <li>Describe how activity-based cost information can be used in a service business for improved decision making.</li> </ul>		

## **Key Terms**

activities (1207) activity base (1209) activity rates (1208) activity-based costing (ABC) method (1207) engineering change order (ECO) (1208) multiple production department factory overhead rate method (1203) product costing (1200) production department factory overhead rate (1204) setup (1208) single plantwide factory overhead rate method (1201)

## **Illustrative Problem**

Hammer Company plans to use activity-based costing to determine its product costs. It presently uses a single plantwide factory overhead rate for allocating factory overhead to products, based on direct labor hours. The total factory overhead cost is as follows:

Department	Factory Overhead
Production Support	\$1,225,000
Production (factory overhead only)	175,000
Total cost	\$1,400,000

The company determined that it performed four major activities in the Production Support Department. These activities, along with their budgeted activity costs, are as follows:

Production Support Activities	<b>Budgeted Activity Cost</b>
Setup	\$ 428,750
Production control	245,000
Quality control	183,750
Materials management	367,500
Total	\$1,225,000

Hammer estimated the following activity-base usage and units produced for each of its three products:

	Number of	Direct	Production			Material
Products	Units	Labor Hrs.	Setups	Orders	Inspections	Requisitions
LCD TV	10,000	25,000	80	80	35	320
Tablet	2,000	10,000	40	40	40	400
Smart phone	50,000	140,000	5	5	_0	_30
Total cost	62,000	175,000	125	125	<u>75</u>	750

#### **Instructions**

- 1. Determine the factory overhead cost per unit for the LCD TV, tablet, and smart phone under the single plantwide factory overhead rate method. Use direct labor hours as the activity base.
- 2. Determine the factory overhead cost per unit for the LCD TV, tablet, and smart phone under activity-based costing. Round to two decimal places.
- 3. Which method provides more accurate product costing? Why?

#### **Solution**

1. Single Plantwide Factory Overhead Rate =  $\frac{\$1,400,000}{175,000 \text{ direct labor hours}}$ = \$8 per direct labor hour

Factory overhead cost per unit:

	LCD TV	Tablet	Smart Phone
Number of direct labor hours	25,000	10,000	140,000
Single plantwide factory overhead rate	$\times$ \$8/dlh	$\times$ \$8/dlh	$\times$ \$8/dlh
Total factory overhead	\$200,000	\$ 80,000	\$ 1,120,000
Number of units	÷ 10,000	÷ 2,000	÷ 50,000
Factory overhead cost per unit	\$ 20.00	\$ 40.00	\$ 22.40

2. Under activity-based costing, an activity rate must be determined for each activity pool:

	<b>Budgeted Activit</b>	ty	<b>Total Activity-</b>		
Activity	Cost	÷	Base Usage	=	Activity Rate
Setup	. \$428,750	÷	125 setups	=	\$3,430 per setup
Production control	. \$245,000	÷	125 production	=	\$1,960 per production
			orders		order
Quality control	. \$183,750	÷	75 inspections	=	\$2,450 per inspection
Materials management	. \$367,500	÷	750 requisitions	=	\$490 per requisition
Production	. \$175,000	÷	175,000 direct	=	\$1 per direct
			labor hours		labor hour

These activity rates can be used to determine the activity-based factory overhead cost per unit as follows:

#### **LCD TV**

	<b>Activity-Base</b>				Activity
Activity	Usage	×	<b>Activity Rate</b>	=	Cost
Setup	80 setups	×	\$3,430	=	\$274,400
Production control	80 production orders	×	\$1,960	=	156,800
Quality control	35 inspections	×	\$2,450	=	85,750
Materials management	320 requisitions	×	\$490	=	156,800
Production	25,000 direct labor hrs.	×	\$1	=	25,000
Total factory overhead					\$698,750
Unit volume					÷ 10,000
Factory overhead					
cost per unit					\$ 69.88

#### **Tablet**

Activity	Activity-Base Usage	×	Activity Rate	=	Activity Cost
Setup	40 setups	X	\$3,430	=	\$137,200
Production control	40 production orders	×	\$1,960	=	78,400
Quality control	40 inspections	×	\$2,450	=	98,000
Materials management	400 requisitions	×	\$490	=	196,000
Production	10,000 direct labor hrs.	×	\$1	=	10,000
Total factory overhead					\$519,600
Unit volume					÷ 2,000
Factory overhead cost per unit					\$ 259.80

#### **Smart phone**

	Activity-Base				Activity
Activity	Usage	×	<b>Activity Rate</b>	=	Cost
Setup	5 setups	×	\$3,430	=	\$ 17,150
Production control	5 production orders	×	\$1,960	=	9,800
Quality control	0 inspections	$\times$	\$2,450	=	0
Materials management	30 requisitions	$\times$	\$490	=	14,700
Production	140,000 direct labor hrs.	×	\$1	=	140,000
Total factory overhead					\$181,650
Unit volume					÷ 50,000
Factory overhead					
cost per unit					\$ 3.63

3 Activity-based costing is more accurate, compared to the single plantwide factory overhead rate method. Activity-based costing properly shows that the smart phone is actually less expensive to make, while the other two products are more expensive to make. The reason is that the single plantwide factory overhead rate method fails to account for activity costs correctly. The setup, production control, quality-control, and materials management activities are all performed on products in amounts that are proportionately different than their volumes. For example, the tablet requires many of these activities relative to its actual unit volume. The tablet requires 40 setups over a volume of 2,000 units (average production run size = 50 units), while the smart phone has only 5 setups over 50,000 units (average production run size = 10,000 units). Thus, the tablet requires greater support costs relative to the smart phone.

The smart phone requires minimum activity support because it is scheduled in large batches and requires no inspections (has high quality) and few requisitions. The other two products exhibit the opposite characteristics.

## **Discussion Questions**

- Why would management be concerned about the accuracy of product costs?
- 2. Why would a manufacturing company with multiple production departments still prefer to use a single plantwide overhead rate?
- 3. How do the multiple production department and the single plantwide factory overhead rate methods differ?
- 4. Under what two conditions would the multiple production department factory overhead rate method provide more accurate product costs than the single plantwide factory overhead rate method?
- 5. How does activity-based costing differ from the multiple production department factory overhead rate method?
- Shipping, selling, marketing, sales order processing, return processing, and advertising activities can be

- related to products by using activity-based costing. Would allocating these activities to products for financial statement reporting be acceptable according to GAAP?
- 7. What would happen to net income if the activities noted in Discussion Question 6 were allocated to products for financial statement reporting and the inventory increased?
- 8. Under what circumstances might the activity-based costing method provide more accurate product costs than the multiple production department factory overhead rate method?
- 9. When might activity-based costing be preferred over using a relative amount of product sales in allocating selling and administrative expenses to products?
- 10.

How can activity-based costing be used in service companies?

## **Practice Exercises**

#### **EE 26-1** p. 1202

#### PE 26-1A Single plantwide factory overhead rate

OBJ. 2



The total factory overhead for Diva-nation Inc. is budgeted for the year at \$180,000. Diva-nation manufactures two types of men's pants: jeans and khakis. The jeans and khakis each require 0.10 direct labor hour for manufacture. Each product is budgeted for 20,000 units of production for the year. Determine (a) the total number of budgeted direct labor hours for the year, (b) the single plantwide factory overhead rate, and (c) the factory overhead allocated per unit for each product using the single plantwide factory overhead rate.

#### **EE 26-1** p. 1202

#### PE 26-1B Single plantwide factory overhead rate

OBJ. 2



The total factory overhead for Bardot Marine Company is budgeted for the year at \$600,000. Bardot Marine manufactures two types of boats: speedboats and bass boats. The speedboat and bass boat each require 12 direct labor hours for manufacture. Each product is budgeted for 250 units of production for the year. Determine (a) the total number of budgeted direct labor hours for the year, (b) the single plantwide factory overhead rate, and (c) the factory overhead allocated per unit for each product using the single plantwide factory overhead rate.

#### **EE 26-2** p. 1207

#### PE 26-2A Multiple production department factory overhead rates

OBJ. 3



The total factory overhead for Diva-nation is budgeted for the year at \$180,000, divided into two departments: Cutting, \$60,000, and Sewing, \$120,000. Diva-nation manufactures two types of men's pants: jeans and khakis. The jeans require 0.04 direct labor hour in Cutting and 0.06 direct labor hour in Sewing. The khakis require 0.06 direct labor hour in Cutting and 0.04 direct labor hour in Sewing. Each product is budgeted for 20,000 units of production for the year. Determine (a) the total number of budgeted direct labor hours for the year in each department, (b) the departmental factory overhead rates for both departments, and (c) the factory overhead allocated per unit for each product using the department factory overhead allocation rates.

#### **EE 26-2** p. 1207

#### **PE 26-2B** Multiple production department factory overhead rates

OBJ. 3



The total factory overhead for Bardot Marine Company is budgeted for the year at \$600,000 divided into two departments: Fabrication, \$420,000, and Assembly, \$180,000. Bardot Marine manufactures two types of boats: speedboats and bass boats. The speedboats require 8 direct labor hours in Fabrication and 4 direct labor hours in Assembly. The bass boats require 4 direct labor hours in Fabrication and 8 direct labor hours in Assembly. Each product is budgeted for 250 units of production for the year. Determine (a) the total number of budgeted direct labor hours for the year in each department, (b) the departmental factory overhead rates for both departments, and (c) the factory overhead allocated per unit for each product using the department factory overhead allocation rates.

#### **EE 26-3** p. 1212

#### PE 26-3A Activity-based costing: factory overhead costs

OBJ. 4



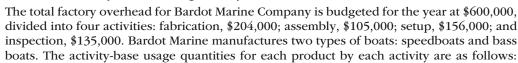
The total factory overhead for Diva-nation is budgeted for the year at \$180,000, divided into four activities: cutting, \$18,000; sewing, \$36,000; setup, \$96,000; and inspection, \$30,000. Diva-nation manufactures two types of men's pants: jeans and khakis. The activity-base usage quantities for each product by each activity are as follows:

	Cutting	Sewing	Setup	Inspection
Jeans	800 dlh	1,200 dlh	1,400 setups	3,000 inspections
Khakis	1,200	800	1,000	2,000
	2,000 dlh	2,000 dlh	2,400 setups	5,000 inspections

Each product is budgeted for 20,000 units of production for the year. Determine (a) the activity rates for each activity and (b) the activity-based factory overhead per unit for each product.

#### EE 26-3 p. 1212 PE 26-3B Activity-based costing: factory overhead costs

**OBJ. 4** 



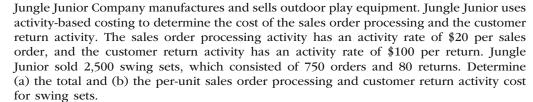
Fabrio	ation	Assembly	Setup	Inspection
Speedboat	2,000 dlh	1,000 dlh	300 setups	1,100 inspections
Bass boat	1,000	2,000	100	400
	3,000 dlh	3,000 dlh	400 setups	1,500 inspections

Each product is budgeted for 250 units of production for the year. Determine (a) the activity rates for each activity and (b) the activity-based factory overhead per unit for each product.

#### EE 26-4 p. 1214 PE 26-4A Activity-based costing: selling and administrative expenses

Fancy Feet Company manufactures and sells shoes. Fancy Feet uses activity-based costing to determine the cost of the sales order processing and the shipping activity. The sales order processing activity has an activity rate of \$12 per sales order, and the shipping activity has an activity rate of \$20 per shipment. Fancy Feet sold 27,500 units of walking shoes, which consisted of 5,000 orders and 1,400 shipments. Determine (a) the total and (b) the per-unit sales order processing and shipping activity cost for walking shoes.

#### EE 26-4 p. 1214 PE 26-4B Activity-based costing: selling and administrative expenses





ME HOW

ME HOW

#### PE 26-5A Activity-based costing for a service business

OBJ. 6

Draper Bank uses activity-based costing to determine the cost of servicing customers. There are three activity pools: teller transaction processing, check processing, and ATM transaction processing. The activity rates associated with each activity pool are \$3.50 per teller transaction, \$0.12 per canceled check, and \$0.10 per ATM transaction. Corner Cleaners Inc. had 12 teller transactions, 100 canceled checks, and 20 ATM transactions during the month. Determine the total monthly activity-based cost for Corner Cleaners Inc. during the month.



#### **EE 26-5** *p* 1216

#### PE 26-5B Activity-based costing for a service business

OBJ. 6



Sterling Hotel uses activity-based costing to determine the cost of servicing customers. There are three activity pools: guest check-in, room cleaning, and meal service. The activity rates associated with each activity pool are \$8.00 per guest check-in, \$25.00 per room cleaning, and \$4.00 per served meal (not including food). Ginny Campbell visited the hotel for a 3-night stay. Campbell had three meals in the hotel during her visit. Determine the total activity-based cost for Campbell's visit.

#### **Exercises**

#### EX 26-1 Single plantwide factory overhead rate

OBJ. 2

Nixon Machine Parts Inc.'s Fabrication Department incurred \$560,000 of factory overhead cost in producing gears and sprockets. The two products consumed a total of 8,000 direct machine hours. Of that amount, sprockets consumed 5,150 direct machine hours.

Determine the total amount of factory overhead that should be allocated to sprockets using machine hours as the allocation base.

#### EX 26-2 Single plantwide factory overhead rate

OBJ. 2

✓ a. \$40 per direct labor hour

Matt's Music Inc. makes three musical instruments: trumpets, tubas, and trombones. The budgeted factory overhead cost is \$188,000. Factory overhead is allocated to the three products on the basis of direct labor hours. The products have the following budgeted production volume and direct labor hours per unit:

	Budgeted Production Volume	Direct Labor Hours per Unit
Trumpets	2,100 units	0.8
Tubas	750	1.6
Trombones	1,300	1.4

- a. Determine the single plantwide factory overhead rate.
- b. Use the factory overhead rate in (a) to determine the amount of total and per-unit factory overhead allocated to each of the three products.

#### EX 26-3 Single plantwide factory overhead rate

OBJ. 2

✓ a. \$60 per processing hour

Salty Sensations Snacks Company manufactures three types of snack foods: tortilla chips, potato chips, and pretzels. The company has budgeted the following costs for the upcoming period:

Factory depreciation	\$ 31,360
Indirect labor	78,400
Factory electricity	7,840
Indirect materials	35,400
Selling expenses	25,000
Administrative expenses	18,000
Total costs	\$196,000

Factory overhead is allocated to the three products on the basis of processing hours. The products had the following production budget and processing hours per case:

	Budgeted Volume (Cases)	Processing Hours per Case
Tortilla chips	4,000	0.20
Potato chips	5,000	0.15
Pretzels	2,500	0.40
Total	11,500	

- a. Determine the single plantwide factory overhead rate.
- b. Use the factory overhead rate in (a) to determine the amount of total and per-case factory overhead allocated to each of the three products under generally accepted accounting principles.

## **EX 26-4** Product costs and product profitability reports, using a single plantwide OBJ. 2 factory overhead rate

✓ c. Pistons gross profit, \$108,000





Orange County Engine Parts Inc. (OCEP) produces three products—pistons, valves, and cams—for the heavy equipment industry. OCEP has a very simple production process and product line and uses a single plantwide factory overhead rate to allocate overhead to the three products. The factory overhead rate is based on direct labor hours. Information about the three products for 2016 is as follows:

	Budgeted Volume (Units)	Direct Labor Hours per Unit	Price per Unit	Direct Materials per Unit
Pistons	7,200	0.20	\$50	\$25
Valves	28,800	0.15	10	4
Cams	1,200	0.32	70	29

The estimated direct labor rate is \$20 per direct labor hour. Beginning and ending inventories are negligible and are, thus, assumed to be zero. The budgeted factory overhead for OCEP is \$184,320.

- a. Determine the plantwide factory overhead rate.
- b. Determine the factory overhead and direct labor cost per unit for each product.
- c. Use the information provided to construct a budgeted gross profit report by product line for the year ended December 31, 2016. Include the gross profit as a percent of sales in the last line of your report, rounded to one decimal place.
- d. What does the report in (c) indicate to you?

#### EX 26-5 Multiple production department factory overhead rate method

OBJ. 3

Hand Armour, Inc. produces three types of high performance sports gloves: small, medium, and large. A glove pattern is first stenciled onto leather in the Pattern Department. The stenciled patterns are then sent to the Cut and Sew Department, where the glove is cut and sewed together. Sports Glove uses the multiple production department factory overhead rate method of allocating factory overhead costs. Its factory overhead costs were budgeted as follows:

Pattern Department overhead	\$288,000
Cut and Sew Department overhead	412,500
Total	\$700,500

The direct labor estimated for each production department was as follows:

Pattern Department	2,880 direct labor hours
Cut and Sew Department	3,300
Total	6,180 direct labor hours

Direct labor hours are used to allocate the production department overhead to the products. The direct labor hours per unit for each product for each production department were obtained from the engineering records as follows:

<b>Production Departments</b>	Small Glove	Medium Glove	<b>Large Glove</b>
Pattern Department	0.10	0.12	0.14
Cut and Sew Department	0.12	0.14	0.16
Direct labor hours per unit	0.22	0.26	0.30

- a. Determine the two production department factory overhead rates.
- b. Use the two production department factory overhead rates to determine the factory overhead per unit for each product.

✓ b. Small glove, \$25.00 per unit





# **EX 26-6** Single plantwide and multiple production department factory overhead rate methods and product cost distortion

OBJ. 2, 3

✓ b. Residential motor, \$330 per unit

Pineapple Motor Company manufactures two types of specialty electric motors, a commercial motor and a residential motor, through two production departments, Assembly and Testing. Presently, the company uses a single plantwide factory overhead rate for allocating factory overhead to the two products. However, management is considering using the multiple production department factory overhead rate method. The following factory overhead was budgeted for Pineapple:

Assembly Department	\$240,000
Testing Department	750,000
Total	\$990,000

Direct machine hours were estimated as follows:

Assembly Department	3,000 hours
Testing Department	6,000
Total	9,000 hours

In addition, the direct machine hours (dmh) used to produce a unit of each product in each department were determined from engineering records, as follows:

	Commercial	Residential
Assembly Department	1.5 dmh	1.0 dmh
Testing Department	3.0	2.0
Total machine hours per unit	4.5 dmh	3.0 dmh

- a. Determine the per-unit factory overhead allocated to the commercial and residential motors under the single plantwide factory overhead rate method, using direct machine hours as the allocation base.
- b. Determine the per-unit factory overhead allocated to the commercial and residential motors under the multiple production department factory overhead rate method, using direct machine hours as the allocation base for each department.
- c. Recommend to management a product costing approach, based on your analyses in (a) and (b). Support your recommendation.

# **EX 26-7** Single plantwide and multiple production department factory overhead rate methods and product cost distortion

OBJ. 2, 3

✓ b. Diesel engine, \$370 per unit The management of Firebolt Industries Inc. manufactures gasoline and diesel engines through two production departments, Fabrication and Assembly. Management needs accurate product cost information in order to guide product strategy. Presently, the company uses a single plantwide factory overhead rate for allocating factory overhead to the two products. However, management is considering the multiple production department factory overhead rate method. The following factory overhead was budgeted for Firebolt:

Fabrication Department factory overhead	\$550,000
Assembly Department factory overhead	250,000
Total	\$800,000

Direct labor hours were estimated as follows:

Fabrication Department	5,000 hours
Assembly Department	5,000
Total	10,000 hours

In addition, the direct labor hours (dlh) used to produce a unit of each product in each department were determined from engineering records, as follows:

<b>Production Departments</b>	<b>Gasoline Engine</b>	<b>Diesel Engine</b>
Fabrication Department	3.0 dlh	2.0 dlh
Assembly Department	2.0	3.0
Direct labor hours per unit	5.0 dlh	5.0 dlh

- a. Determine the per-unit factory overhead allocated to the gasoline and diesel engines under the single plantwide factory overhead rate method, using direct labor hours as the activity base.
- b. Determine the per-unit factory overhead allocated to the gasoline and diesel engines under the multiple production department factory overhead rate method, using direct labor hours as the activity base for each department.
- c. Recommend to management a product costing approach, based on your analyses in (a) and (b). Support your recommendation.

#### **EX 26-8** Identifying activity bases in an activity-based cost system

**OBJ. 4** 

Select Foods Inc. uses activity-based costing to determine product costs. For each activity listed in the left column, match an appropriate activity base from the right column. You may use items in the activity-base list more than once or not at all.

Activity	Activity Base	
Accounting reports	Engineering change orders	
Customer return processing	Kilowatt hours used	
Electric power	Number of accounting reports	
Human resources	Number of customers	
Inventory control	Number of customer orders	
Invoice and collecting	Number of customer returns	
Machine depreciation	Number of employees	
Materials handling	Number of inspections	
Order shipping	Number of inventory transactions	
Payroll	Number of machine hours	
Production control	Number of material moves	
Production setup	Number of payroll checks processed	
Purchasing	Number of production orders	
Quality control	Number of purchase orders	
Sales order processing	Number of sales orders	
	Number of setups	

#### **EX 26-9** Product costs using activity rates

OBJ. 4

Nozama.com Inc. sells consumer electronics over the Internet. For the next period, the budgeted cost of the sales order processing activity is \$540,000 and 60,000 sales orders are estimated to be processed.

- a. Determine the activity rate of the sales order processing activity.
- b. Determine the amount of sales order processing cost that Nozama.com would receive if it had 45,000 sales orders.

#### **EX 26-10** Product costs using activity rates

OBJ. 4

Endurance Enterprises Inc. manufactures elliptical exercise machines and treadmills. The products are produced in its Fabrication and Assembly production departments. In addition to production activities, several other activities are required to produce the two products. These activities and their associated activity rates are as follows:

Activity	Activity Rate
Fabrication	\$30 per machine hour
Assembly	\$15 per direct labor hour
Setup	\$50 per setup
Inspecting	\$25 per inspection
Production scheduling	\$15 per production order
Purchasing	\$10 per purchase order

**✓** b. \$405,000

✓ Treadmill activity cost per unit, \$135



The activity-base usage quantities and units produced for each product were as follows:

Activity Base	Elliptical Machines	Treadmill
Machine hours	800	500
Direct labor hours	210	90
Setups	24	10
Inspections	140	160
Production orders	20	10
Purchase orders	85	60
Units produced	300	160

Use the activity rate and usage information to calculate the total activity cost and activity cost per unit for each product.

#### EX 26-11 Activity rates and product costs using activity-based costing

OBJ. 4

✓ b. Dining room lighting fixtures, \$50 per unit



Lightsquare Inc. manufactures entry and dining room lighting fixtures. Five activities are used in manufacturing the fixtures. These activities and their associated budgeted activity costs and activity bases are as follows:

Activity	Activity Cost	Activity Base
Casting	\$127,750	Machine hours
Assembly	63,200	Direct labor hours
Inspecting	21,330	Number of inspections
Setup	28,750	Number of setups
Materials handling	31,600	Number of loads

Corporate records were obtained to estimate the amount of activity to be used by the two products. The estimated activity-base usage quantities and units produced follow:

Activity Base	Entry	Dining	Total
Machine hours	2500	1,150	3,650
Direct labor hours	960	2,200	3,160
Number of inspections	860	325	1,185
Number of setups	170	60	230
Number of loads	570	220	790
Units produced	5,541	2,128	7,669

- a. Determine the activity rate for each activity.
- b. Use the activity rates in (a) to determine the total and per-unit activity costs associated with each product.

# **EX 26-12** Activity cost pools, activity rates, and product costs using activity-based costing

**OBJ. 4** 

✓ b. Ovens, \$75 per unit



Hipster Home Appliances Inc. is estimating the activity cost associated with producing ovens and refrigerators. The indirect labor can be traced into four separate activity pools, based on time records provided by the employees. The budgeted activity cost and activity-base information are provided as follows:

Activity	Activity Pool Cost	Activity Base
Procurement	\$66,000	Number of purchase orders
Scheduling	4,120	Number of production orders
Materials handling	13,280	Number of moves
Product development	8,100	Number of engineering changes
Total cost	\$91,500	

The estimated activity-base usage and unit information for two product lines was determined from corporate records as follows:

	Number of Purchase Orders	Number of Production Orders	Number of Moves	Number of Engineering Changes	Units
Ovens	400	136	240	68	740
Refrigerators	260	70	175	40	600
Totals	660	206	415	108	1,340

- a. Determine the activity rate for each activity cost pool.
- b. Determine the activity-based cost per unit of each product.

#### EX 26-13 Activity-based costing and product cost distortion

OBJ. 2, 4

Digital Storage Concept Inc. is considering a change to activity-based product costing. The company produces two products, cell phones and tablet PCs, in a single production department. The production department is estimated to require 3,750 direct labor hours. The total indirect labor is budgeted to be \$375,000.

Time records from indirect labor employees revealed that they spent 40% of their time setting up production runs and 60% of their time supporting actual production.

The following information about cell phones and tablet PCs was determined from the corporate records:

	Number of	Direct Labor	11-24-
	Setups	Hours	Units
Cell phones	600	1,875	93,750
Tablet PCs	1,400	1,875	93,750
Total	2,000	3,750	187,500

- a. Determine the indirect labor cost per unit allocated to cell phones and tablet PCs under a single plantwide factory overhead rate system using the direct labor hours as the allocation base.
- b. Determine the budgeted activity costs and activity rates for the indirect labor under activity-based costing. Assume two activities—one for setup and the other for production support.
- Determine the activity cost per unit for indirect labor allocated to each product under activity-based costing.
- d. Why are the per-unit allocated costs in (a) different from the per-unit activity cost assigned to the products in (c)?

#### EX 26-14 Multiple production department factory overhead rate method

OBJ. 3

Four Finger Appliance Company manufactures small kitchen appliances. The product line consists of blenders and toaster ovens. Four Finger Appliance presently uses the multiple production department factory overhead rate method. The factory overhead is as follows:

Assembly Department	\$186,000
Test and Pack Department	120,000
Total	\$306,000

The direct labor information for the production of 7,500 units of each product is as follows:

	Assembly Department	Test and Pack Department
Blender	750 dlh	2,250 dlh
Toaster oven	2,250	750
Total	3,000 dlh	3,000 dlh

✓ c. Cell phones, \$1.68 per unit



✓ b. Blender, \$18.20
per unit



Four Finger Appliance used direct labor hours to allocate production department factory overhead to products.

- a. Determine the two production department factory overhead rates.
- b. Determine the total factory overhead and the factory overhead per unit allocated to each product.

#### EX 26-15 Activity-based costing and product cost distortion

OBJ. 4

✓ b. Blender, \$23.60 per unit



The management of Four Finger Appliance Company in Exercise 26-14 has asked you to use activity-based costing to allocate factory overhead costs to the two products. You have determined that \$81,000 of factory overhead from each of the production departments can be associated with setup activity (\$162,000 in total). Company records indicate that blenders required 135 setups, while the toaster ovens required only 45 setups. Each product has a production volume of 7,500 units.

- a. Determine the three activity rates (assembly, test and pack, and setup).
- b. Determine the total factory overhead and factory overhead per unit allocated to each product using the activity rates in (a).

#### EX 26-16 Single plantwide rate and activity-based costing

OBJ. 2, 4

✓ a. Low, Col. C, 93.5%





Whirlpool Corporation conducted an activity-based costing study of its Evansville, Indiana, plant in order to identify its most profitable products. Assume that we select three representative refrigerators (out of 333): one low-, one medium-, and one high-volume refrigerator. Additionally, we assume the following activity-base information for each of the three refrigerators:

Three Representative Refrigerators	Number of Machine Hours	Number of Setups	Number of Sales Orders	Number of Units
Refrigerator—Low Volume	24	14	38	160
Refrigerator—Medium Volume	225	13	88	1,500
Refrigerator—High Volume	900	9	120	6,000

Prior to conducting the study, the factory overhead allocation was based on a single machine hour rate. The machine hour rate was \$200 per hour. After conducting the activity-based costing study, assume that three activities were used to allocate the factory overhead. The new activity rate information is assumed to be as follows:

	<b>Machining Activity</b>	Setup Activity	Sales Order Processing Activity
Activity rate	\$160	\$240	\$55

a. Complete the following table, using the single machine hour rate to determine the perunit factory overhead for each refrigerator (Column A) and the three activity-based rates to determine the activity-based factory overhead per unit (Column B). Finally, compute the percent change in per-unit allocation from the single to activity-based rate methods (Column C). Round per-unit overhead to two decimal places and percents to one decimal place.

	Column A		
	Single Rate	Column B	Column C
	Overhead	<b>ABC Overhead</b>	Percent Change
	Allocation	Allocation	in Allocation
<b>Product Volume Class</b>	per Unit	per Unit	(Col. B - Col. A)/Col. A

Low

Medium

Higl

- b. Why is the traditional overhead rate per machine hour greater under the single rate method than under the activity-based method?
- c. Interpret Column C in your table from part (a).

#### **EX 26-17** Evaluating selling and administrative cost allocations

OBJ. 5

Gordon Gecco Furniture Company has two major product lines with the following characteristics:

- Commercial office furniture: Few large orders, little advertising support, shipments in full truckloads, and low handling complexity
- Home office furniture: Many small orders, large advertising support, shipments in partial truckloads, and high handling complexity

The company produced the following profitability report for management:

#### Gordon Gecco Furniture Company Product Profitability Report For the Year Ended December 31

	Commercial Office Furniture	Home Office Furniture	Total
Revenue	\$5,600,000	\$2,800,000	\$8,400,000
Cost of goods sold	2,100,000	980,000	3,080,000
Gross profit	\$3,500,000	\$1,820,000	\$5,320,000
Selling and administrative expenses	1,680,000	840,000	2,520,000
Income from operations	\$1,820,000	\$ 980,000	\$2,800,000

The selling and administrative expenses are allocated to the products on the basis of relative sales dollars.

Evaluate the accuracy of this report and recommend an alternative approach.

# **EX 26-18** Construct and interpret a product profitability report, allocating selling and administrative expenses

**OBJ. 5** 

Volt-Gear Inc. manufactures power equipment. Volt-Gear has two primary products—generators and air compressors. The following report was prepared by the controller for Volt-Gear senior marketing management for the year ended December 31:

	Generators	Air Compressors	Total
Revenue	\$2,000,000	\$1,400,000	\$3,400,000
Cost of goods sold	1,400,000	980,000	2,380,000
Gross profit	\$ 600,000	\$ 420,000	\$1,020,000
Selling and administrative expenses			353,000
Income from operations			\$ 667,000

The marketing management team was concerned that the selling and administrative expenses were not traced to the products. Marketing management believed that some products consumed larger amounts of selling and administrative expense than did other products. To verify this, the controller was asked to prepare a complete product profitability report, using activity-based costing.

The controller determined that selling and administrative expenses consisted of two activities: sales order processing and post-sale customer service. The controller was able to determine the activity base and activity rate for each activity, as follows:

Activity	Activity Base	Activity Rate
Sales order processing	Sales orders	\$ 80 per sales order
Post-sale customer service	Service requests	\$300 per customer service request

The controller determined the following activity-base usage information about each product:

	Generators	Air Compressors
Number of sales orders	980	1,160
Number of service requests	150	456

✓ b. Generators operating profit-to-sales, 23.83%



- a. Determine the activity cost of each product for sales order processing and post-sale customer service activities.
- b. Use the information in (a) to prepare a complete product profitability report dated for the year ended December 31. Calculate the gross profit to sales and the income from operations to sales percentages for each product.
- Interpret the product profitability report. How should management respond to the report?

# ✓ a. Customer 1.





#### EX 26-19 Activity-based costing and customer profitability

OBJ. 5

Schneider Electric manufactures power distribution equipment for commercial customers, such as hospitals and manufacturers. Activity-based costing was used to determine customer profitability. Customer service activities were assigned to individual customers, using the following assumed customer service activities, activity base, and activity rate:

<b>Customer Service Activity</b>	Activity Base	Activity Rate
Bid preparation	Number of bid requests	\$200/request
Shipment	Number of shipments	\$16/shipment
Support standard items	Number of standard items ordered	\$20/std. item
Support nonstandard items	Number of nonstandard items ordered	\$75/nonstd.item

Assume that the company had the following gross profit information for three representative customers:

	Customer 1	Customer 2	Customer 3
Revenue	\$39,000	\$26,000	\$31,200
Cost of goods sold	24,180	13,520	15,600
Gross profit	\$14,820	\$12,480	\$15,600
Gross profit as a percent of sales	38%	48%	50%

The administrative records indicated that the activity-base usage quantities for each customer were as follows:

Activity Base	Customer 1	Customer 2	Customer 3
Number of bid requests	12	8	25
Number of shipments	16	24	45
Number of standard items ordered	48	38	56
Number of nonstandard items ordered	18	30	54

- a. Prepare a customer profitability report dated for the year ended December 31, 2016, showing (1) the income from operations after customer service activities, (2) the gross profit as a percent of sales, and (3) the income from operations after customer service activities as a percent of sales. Prepare the report with a column for each customer. Round percentages to the nearest whole percent.
- b. Interpret the report in part (a).

#### **EX 26-20** Activity-based costing for a service company

Crosswinds Hospital plans to use activity-based costing to assign hospital indirect costs to the care of patients. The hospital has identified the following activities and activity rates for the hospital indirect costs:

Activity	Activity Rate	
Room and meals	\$240 per day	
Radiology	\$215 per image	
Pharmacy	\$ 50 per physician order	
Chemistry lab	\$ 80 per test	
Operating room	\$1,000 per operating room hour	

Income from operations after customer service activities, \$9,854





✓ a. Patient Umit, \$6.025





The activity usage information associated with the two patients is as follows:

	Patient Putin	Patient Umit
Number of days	6 days	4 days
Number of images	4 images	3 images
Number of physician orders	6 orders	2 orders
Number of tests	5 tests	4 tests
Number of operating room hours	8 hours	4 hours

- a. Determine the activity cost associated with each patient.
- b. Why is the total activity cost different for the two patients?

# ✓ a. Auto, Income from operations, \$820,380







#### EX 26-21 Activity-based costing for a service company

OBJ. 5, 6

Safety First Insurance Company carries three major lines of insurance: auto, workers' compensation, and homeowners. The company has prepared the following report:

#### Safety First Insurance Company Product Profitability Report For the Year Ended December 31

	Auto	Workers' Compensation	Homeowners
Premium revenue	\$5,750,000	\$6,240,000	\$8,160,000
Less estimated claims	4,312,500	4,680,000	6,120,000
Underwriting income	\$1,437,500	\$1,560,000	\$2,040,000
Underwriting income as a percent of premium revenue	25%	25%	25%

Management is concerned that the administrative expenses may make some of the insurance lines unprofitable. However, the administrative expenses have not been allocated to the insurance lines. The controller has suggested that the administrative expenses could be assigned to the insurance lines using activity-based costing. The administrative expenses are comprised of five activities. The activities and their rates are as follows:

	Activity Rates
New policy processing	\$120 per new policy
Cancellation processing	\$175 per cancellation
Claim audits	\$320 per claim audit
Claim disbursements processing	\$104 per disbursement
Premium collection processing	\$24 per premium collected

Activity-base usage data for each line of insurance was retrieved from the corporate records and follows:

	Workers'		
	Auto	Compensation	Homeowners
Number of new policies	1,320	1,500	4,080
Number of canceled policies	480	240	2,160
Number of audited claims	385	120	960
Number of claim disbursements	480	216	840
Number of premiums collected	8,400	1,800	15,000

- a. Complete the product profitability report through the administrative activities. Determine the income from operations as a percent of premium revenue, rounded to the nearest whole percent.
- b. Interpret the report.

## **Problems Series A**

# ✓ 1. b. \$48 per machine hour

#### PR 26-1A Single plantwide factory overhead rate

OBJ. 2

Orange County Chrome Company manufactures three chrome-plated products—automobile bumpers, valve covers, and wheels. These products are manufactured in two production departments (Stamping and Plating). The factory overhead for Orange County Chrome is \$220,800.

The three products consume both machine hours and direct labor hours in the two production departments as follows:

Direct Labor Hours		Machine Hours	
Stamping Department			
Automobile bumpers	560	800	
Valve covers	300	560	
Wheels	340	600	
	1,200	1,960	
Plating Department			
Automobile bumpers	170	1,170	
Valve covers	180	710	
Wheels	175	760	
	525	2,640	
Total	1,725	4,600	

#### **Instructions**

- 1. Determine the single plantwide factory overhead rate, using each of the following allocation bases: (a) direct labor hours and (b) machine hours.
- 2. Determine the product factory overhead costs, using (a) the direct labor hour plantwide factory overhead rate and (b) the machine hour plantwide factory overhead rate.

#### PR 26-2A Multiple production department factor overhead rates

✓ 2. Wheels, \$63,040 The management of Orange County Chrome Company, described in Problem 26-1A, now plans to use the multiple production department factory overhead rate method. The total factory overhead associated with each department is as follows:

Stamping Department	\$115,200
Plating Department	105,600
Total	\$220,800

#### **Instructions**

- 1. Determine the multiple production department factory overhead rates, using direct labor hours for the Stamping Department and machine hours for the Plating Department.
- 2. Determine the product factory overhead costs, using the multiple production department rates in (1).

# PR 26-3A Activity-based and department rate product costing and product cost distortions

**OBJ. 3, 4** 

OBJ. 3

Black and Blue Sports Inc. manufactures two products: snowboards and skis. The factory overhead incurred is as follows:

Indirect labor\$507,000Cutting Department156,000Finishing Department192,000Total\$855,000

✓ 2. Snowboards, \$390,000 and \$65



The activity base associated with the two production departments is direct labor hours. The indirect labor can be assigned to two different activities as follows:

Activity	<b>Budgeted Activity Cost</b>	Activity Base
Production control	\$237,000	Number of production runs
Materials handling	270,000	Number of moves
Total	\$507,000	

The activity-base usage quantities and units produced for the two products follow:

	Number of Production Runs	Number of Moves	Direct Labor Hours—Cutting	Direct Labor Hours—Finishing	Units Produced
Snowboards	430	5,000	4,000	2,000	6,000
Skis	_70	2,500	2,000	4,000	6,000
Total	500	7,500	6,000	6,000	12,000

#### **Instructions**

- 1. Determine the factory overhead rates under the multiple production department rate method. Assume that indirect labor is associated with the production departments, so that the total factory overhead is \$315,000 and \$540,000 for the Cutting and Finishing departments, respectively.
- 2. Determine the total and per-unit factory overhead costs allocated to each product, using the multiple production department overhead rates in (1).
- 3. Determine the activity rates, assuming that the indirect labor is associated with activities rather than with the production departments.
- 4. Determine the total and per-unit cost assigned to each product under activity-based costing.
- Explain the difference in the per-unit overhead allocated to each product under the multiple production department factory overhead rate and activity-based costing methods.

#### PR 26-4A Activity-based product costing

OBJ. 4

Teldar Manufacturing Company is a diversified manufacturer that manufactures three products (M5, Z4, and I8) in a continuous production process. Senior management has asked the controller to conduct an activity-based costing study. The controller identified the amount of factory overhead required by the critical activities of the organization as follows:

Activity	Activity Cost Pool
Production	\$264,000
Setup	96,000
Material handling	9,600
Inspection	50,000
Product engineering	150,000
Total	\$569,600

The activity bases identified for each activity are as follows:

Activity	Activity Base
Production	Machine hours
Setup	Number of setups
Material handling	Number of parts
Inspection	Number of inspection hours
Product engineering	Number of engineering hours

✓ 2. Z4 total activity cost, \$195,300



The activity-base usage quantities and units produced for the three products were determined from corporate records and are as follows:

	Machine Hours	Number of Setups	Number of Parts	Number of Inspection Hours	Number of Engineering Hours	Units
M5	1,000	60	80	450	125	1,250
Z4	800	120	150	300	175	1,000
18	400	220	250	250	200	500
Total	2,200	400	480	1,000	500	2,750

Each product requires 0.8 machine hour per unit.

#### **Instructions**

1. Determine the activity rate for each activity.

bases associated with these activities are:

- 2. Determine the total and per-unit activity cost for all three products.
- 3. Why aren't the activity unit costs equal across all three products since they require the same machine time per unit?

# PR 26-5A Allocating selling and administrative expenses using activity-based OBJ. 5 costing

Cold Zone Mechancial Inc. manufactures cooling units for commercial buildings. The price and cost of goods sold for each unit are as follows:

Price \$75,000 per unit Cost of goods sold  $\frac{60,000}{$15,000}$  per unit

In addition, the company incurs selling and administrative expenses of \$231,880. The company wishes to assign these costs to its three major customers, Good Knowledge University, Hot Shotz Arena, and Break-a-Leg Hospital. These expenses are related to three major nonmanufacturing activities: customer service, project bidding, and engineering support. The engineering support is in the form of engineering changes that are placed by

the customer to change the design of a product. The budgeted activity costs and activity

Activity	<b>Budgeted Activity Cost</b>	Activity Base
Customer service	\$ 83,720	Number of service requests
Project bidding	61,360	Number of bids
Engineering support	86,800	Number of customer design changes
Total costs	\$231,880	

Activity-base usage and unit volume information for the three customers is as follows:

	Good Knowledge University	Hot Shotz Arena	Break-a-Leg Hospital	Total
Number of service requests	60	52	210	322
Number of bids	36	18	50	104
Number of customer design changes	45	30	142	217
Unit volume	22	14	6	42

#### Instructions

- 1. Determine the activity rates for each of the three nonmanufacturing activity pools.
- 2. Determine the activity costs allocated to the three customers, using the activity rates in (1).

(Continued)

✓ 3. Break-a-Leg Hospital loss from operations, (\$50,900)





- 3. Construct customer profitability reports for the three customers, dated for the year ended December 31, using the activity costs in (2). The reports should disclose the gross profit and income from operations associated with each customer.
- 4. Provide recommendations to management, based on the profitability reports in (3).

#### PR 26-6A Product costing and decision analysis for a service company

0BJ. 6

Pleasant Stay Medical Inc. wishes to determine its product costs. Pleasant Stay offers a variety of medical procedures (operations) that are considered its "products." The overhead has been separated into three major activities. The annual estimated activity costs and activity bases follow:

Activity	<b>Budgeted Activity Cost</b>	<b>Activity Base</b>
Scheduling and admitting	\$ 432,000	Number of patients
Housekeeping	4,212,000	Number of patient days
Nursing	5,376,000	Weighted care unit
Total costs	\$10,020,000	

Total "patient days" are determined by multiplying the number of patients by the average length of stay in the hospital. A weighted care unit (wcu) is a measure of nursing effort used to care for patients. There were 192,000 weighted care units estimated for the year. In addition, Pleasant Stay estimated 6,000 patients and 27,000 patient days for the year. (The average patient is expected to have a a little more than a four-day stay in the hospital.)

During a portion of the year, Pleasant Stay collected patient information for three selected procedures, as follows:

	Activity-Base Usage
Procedure A	
Number of patients	280
Average length of stay	imes 6 days
Patient days	1,680
Weighted care units	19,200
Procedure B	
Number of patients	650
Average length of stay	imes 5 days
Patient days	3,250
Weighted care units	6,000
Procedure C	
Number of patients	1,200
Average length of stay	imes 4 days
Patient days	4,800
Weighted care units	24,000

Private insurance reimburses the hospital for these activities at a fixed daily rate of \$406 per patient day for all three procedures.

#### **Instructions**

- 1. Determine the activity rates.
- 2. Determine the activity cost for each procedure.
- 3. Determine the excess or deficiency of reimbursements to activity cost.
- 4. Interpret your results.







## **Problems Series B**

#### PR 26-1B Single plantwide factory overhead rate

OBJ. 2

✓ 1. b. \$111 per machine hour

Spotted Cow Dairy Company manufactures three products—whole milk, skim milk, and cream—in two production departments, Blending and Packing. The factory overhead for Spotted Cow Dairy is \$299,700.

The three products consume both machine hours and direct labor hours in the two production departments as follows:

	Direct Labor Hours	Machine Hours
Blending Department		
Whole milk	260	650
Skim milk	245	710
Cream	215	260
	720	1,620
Packing Department		<del></del>
Whole milk	470	500
Skim milk	300	415
Cream	130	165
	900	1,080
Total	1,620	2,700

#### **Instructions**

- 1. Determine the single plantwide factory overhead rate, using each of the following allocation bases: (a) direct labor hours and (b) machine hours.
- 2. Determine the product factory overhead costs, using (a) the direct labor hour plantwide factory overhead rate and (b) the machine hour plantwide factory overhead rate.

#### PR 26-2B Multiple production department factory overhead rates

OBJ. 3

√ 2. Cream, \$46,150

The management of Spotted Cow Dairy Company, described in Problem 26-1B, now plans to use the multiple production department factory overhead rate method. The total factory overhead associated with each department is as follows:

Blending Department	\$178,200
Packing Department	121,500
Total	\$299,700

#### Instructions

- 1. Determine the multiple production department factory overhead rates, using machine hours for the Blending Department and direct labor hours for the Packing Department.
- 2. Determine the product factory overhead costs, using the multiple production department rates in (1).

# PR 26-3B Activity-based department rate product costing and product cost OBJ. 3, 4 distortions

Big Sound Inc. manufactures two products: receivers and loudspeakers. The factory overhead incurred is as follows:

Indirect labor	\$400,400
Subassembly Department	198,800
Final Assembly Department	114,800
Total	\$714,000

(Continued)

✓ 4. Loudspeakers, \$465,430 and \$66.49



The activity base associated with the two production departments is direct labor hours. The indirect labor can be assigned to two different activities as follows:

Activity	<b>Budgeted Activity Cost</b>	<b>Activity Base</b>
Setup	\$138,600	Number of setups
Quality control	261,800	Number of inspections
Total	\$400,400	

The activity-base usage quantities and units produced for the two products follow:

	Number of Setups	Number of Inspections	Direct Labor Hours— Subassembly	Direct Labor Hours— Final Assembly	Units Produced
Receivers	80	450	875	525	7,000
Loudspeakers	320	1,750	525	875	7,000
Total	400	2,200	1,400	1,400	14,000

#### **Instructions**

- 1. Determine the factory overhead rates under the multiple production department rate method. Assume that indirect labor is associated with the production departments, so that the total factory overhead is \$420,000 and \$294,000 for the Subassembly and Final Assembly departments, respectively.
- 2. Determine the total and per-unit factory overhead costs allocated to each product, using the multiple production department overhead rates in (1).
- 3. Determine the activity rates, assuming that the indirect labor is associated with activities rather than with the production departments.
- 4. Determine the total and per-unit cost assigned to each product under activity-based costing.
- 5. Explain the difference in the per-unit overhead allocated to each product under the multiple production department factory overhead rate and activity-based costing methods.

#### PR 26-4B Activity-based product costing

OBJ. 4

Sweet Sugar Company manufactures three products (white sugar, brown sugar, and powdered sugar) in a continuous production process. Senior management has asked the controller to conduct an activity-based costing study. The controller identified the amount of factory overhead required by the critical activities of the organization as follows:

Activity	Budgeted Activity Cost
Production	\$500,000
Setup	144,000
Inspection	44,000
Shipping	115,000
Customer service	84,000
Total	\$887,000

The activity bases identified for each activity are as follows:

Activity	Activity Base		
Production	Machine hours		
Setup	Number of setups		
Inspection	Number of inspections		
Shipping	Number of customer orders		
Customer service	Number of customer service requests		

The activity-base usage quantities and units produced for the three products were determined from corporate records and are as follows:

✓ 2. Brown sugar total activity cost, \$293,600



	Machine Hours	Number of Setups	Number of Inspections	Number of Customer Orders	Customer Service Requests	Units
White sugar	5,000	85	220	1,150	60	10,000
Brown sugar	2,500	170	330	2,600	350	5,000
Powdered sugar	2,500	195	550	2,000	190	5,000
Total	10,000	450	1,100	5,750	600	20,000

Each product requires 0.5 machine hour per unit.

#### **Instructions**

- 1. Determine the activity rate for each activity.
- 2. Determine the total and per-unit activity cost for all three products. Round to two decimal places.
- 3. Why aren't the activity unit costs equal across all three products since they require the same machine time per unit?

# PR 26-5B Allocating selling and administrative expenses using activity-based OBJ. 5 costing

Shrute Inc. manufactures office copiers, which are sold to retailers. The price and cost of goods sold for each copier are as follows:

Price \$1,110 per unit Cost of goods sold  $\frac{682}{\$ 428}$  per unit

In addition, the company incurs selling and administrative expenses of \$414,030. The company wishes to assign these costs to its three major retail customers, The Warehouse, Kosmo Co., and Supply Universe. These expenses are related to its three major nonmanufacturing activities: customer service, sales order processing, and advertising support. The advertising support is in the form of advertisements that are placed by Shrute Inc. to support the retailer's sale of Shrute copiers to consumers. The budgeted activity costs and activity bases associated with these activities are:

Activity	<b>Budgeted Activity Cost</b>	Activity Base
Customer service	\$ 76,860	Number of service requests
Sales order processing	25,920	Number of sales orders
Advertising support	311,250	Number of ads placed
Total activity cost	\$414,030	

Activity-base usage and unit volume information for the three customers is as follows:

	The		Supply	y	
	Warehouse	Kosmo Co.	Universe	Total	
Number of service requests	62	340	25	427	
Number of sales orders	300	640	140	1,080	
Number of ads placed	25	180	44	249	
Unit volume	810	810	810	2,430	

#### **Instructions**

- 1. Determine the activity rates for each of the three nonmanufacturing activities.
- 2. Determine the activity costs allocated to the three customers, using the activity rates in (1).
- 3. Construct customer profitability reports for the three customers, dated for the year ended December 31, using the activity costs in (2). The reports should disclose the gross profit and income from operations associated with each customer.
- 4. Provide recommendations to management, based on the profitability reports in (3).

✓ 3. Supply Universe, income from operations, \$283,820





√ 3. Flight 102 income from operations, \$4,415





#### PR 26-6B Product costing and decision analysis for a service company

OBJ. 6

Blue Star Airline provides passenger airline service, using small jets. The airline connects four major cities: Charlotte, Pittsburgh, Detroit, and San Francisco. The company expects to fly 170,000 miles during a month. The following costs are budgeted for a month:

Fuel	\$2,120,000
Ground personnel	788,500
Crew salaries	850,000
Depreciation	430,000
Total costs	\$4,188,500

Blue Star management wishes to assign these costs to individual flights in order to gauge the profitability of its service offerings. The following activity bases were identified with the budgeted costs:

Airline Cost	Activity Base
Fuel, crew, and depreciation costs	Number of miles flown
Ground personnel	Number of arrivals and departures at an airport

The size of the company's ground operation in each city is determined by the size of the workforce. The following monthly data are available from corporate records for each terminal operation:

Terminal City	Ground Personnel Cost	Number of Arrivals/Departures	
Charlotte	\$256,000	320	
Pittsburgh	97,500	130	
Detroit	129,000	150	
San Francisco	306,000	340	
Total	\$788,500	940	

Three recent representative flights have been selected for the profitability study. Their characteristics are as follows:

	Description	Miles Flown	Number of Passengers	Ticket Price per Passenger
Flight 101	Charlotte to San Francisco	o 2,000	80	\$695.00
Flight 102	Detroit to Charlotte	800	50	441.50
Flight 103	Charlotte to Pittsburgh	400	20	382.00

#### Instructions

- 1. Determine the fuel, crew, and depreciation cost per mile flown.
- 2. Determine the cost per arrival or departure by terminal city.
- 3. Use the information in (1) and (2) to construct a profitability report for the three flights. Each flight has a single arrival and departure to its origin and destination city pairs.
- 4. Evaluate flight profitability by determining the break-even number of passengers required for each flight assuming all the costs of a flight are fixed. Round to the nearest whole number.

# Cases & Projects



#### CP 26-1 Ethics and professional conduct in business

The controller of Tri Con Global Systems Inc. devised a new costing system based on tracing the cost of activities to products. The controller was able to measure post-manufacturing activities, such as selling, promotional, and distribution activities, and allocate these activities to products in order to have a more complete view of the company's product costs. This effort produced better strategic information about the relative profitability of product

lines. In addition, the controller used the same product cost information for inventory valuation on the financial statements. Surprisingly, the controller discovered that the company's reported net income was larger under this scheme than under the traditional costing approach.

Why was the net income larger, and how would you react to the controller's action?

#### CP 26-2 Identifying product cost distortion

Beachside Beverages Company manufactures soft drinks. Information about two products is as follows:

	Volume	Sales Price per Case	Gross Profit per Case
Storm Soda	800,000 cases	\$30	\$12
Fizz Wiz	10.000 cases	30	12

It is known that both products have the same direct materials and direct labor costs per case. Beachside Beverages allocates factory overhead to products by using a single plantwide factory overhead rate, based on direct labor cost. Additional information about the two products is as follows:

Storm Soda: Requires minor process preparation and sterilization prior to processing. The ingredients are acquired locally. The formulation is simple, and it is easy to maintain quality. Lastly, the product is sold in large bulk (full truckload) orders.

Fizz Wiz: Requires extensive process preparation and sterilization prior to processing. The ingredients are from Jamaica, requiring complex import controls. The formulation is complex, and it is thus difficult to maintain quality. Lastly, the product is sold in small (less than full truckload) orders.



Explain the product profitability report in light of the additional data.





#### **CP 26-3** Activity-based costing for a service company

Wells Fargo Insurance Services (WFIS) is an insurance brokerage company that classified insurance products as either "easy" or "difficult." Easy and difficult products were defined as follows:

Easy: Electronic claims, few inquiries, mature product

Difficult: Paper claims, complex claims to process, many inquiries, a new product with complex options

The company originally allocated processing and service expenses on the basis of revenue. Under this traditional allocation approach, the product profitability report revealed the following:

	Easy	Difficult		
	Product	Product	Total	
Revenue	\$600	\$400	\$1,000	
Processing and service expenses	420	280	700	
Income from operations	\$180	\$120	\$ 300	
Operating income margin	30%	30%	30%	

WFIS decided to use activity-based costing to allocate the processing and service expenses. The following activity-based costing analysis of the same data illustrates a much different profit picture for the two types of products:

	Easy Product	Difficult Product	Total
Revenue	\$600	\$ 400	\$1,000
Processing and service expenses	183	517	700
Income from operations	\$417	\$(117)	\$ 300
Operating income margin	70%	(29%)	30%

Explain why the activity-based profitability report reveals different information from the traditional sales allocation report.

Source: Dan Patras and Kevin Clancy, "ABC in the Service Industry: Product Line Profitability at Acordia, Inc." As Easy as ABC Newsletter, Issue 12, Spring 1993.

#### CP 26-4 Using a product profitability report to guide strategic decisions

The controller of Boom Box Sounds Inc. prepared the following product profitability report for management, using activity-based costing methods for allocating both the factory overhead and the marketing expenses. As such, the controller has confidence in the accuracy of this report. In addition, the controller interviewed the vice president of marketing, who indicated that the floor loudspeakers were an older product that was highly recognized in the marketplace. The ribbon loudspeakers were a new product that was recently launched. The ribbon loudspeakers are a new technology that have no competition in the marketplace, and it is hoped that they will become an important future addition to the company's product portfolio. Initial indications are that the product is well received by customers. The controller believes that the manufacturing costs for all three products are in line with expectations.

	Floor Loudspeakers	Bookshelf Loudspeakers	Ribbon Loudspeakers	Totals
Sales	\$1,500,000	\$1,200,000	\$900,000	\$3,600,000
Less cost of goods sold	1,050,000	720,000	810,000	2,580,000
Gross profit	\$ 450,000	\$ 480,000	\$ 90,000	\$1,020,000
Less marketing expenses	600,000	120,000	72,000	792,000
Income from operations	\$ (150,000)	\$ 360,000	\$ 18,000	\$ 228,000

- 1. Calculate the gross profit and income from operations to sales ratios for each product.
- 2. Write a memo using the product profitability report and the calculations in (1) to make recommendations to management with respect to strategies for the three products.

#### CP 26-5 Product cost distortion

Aldin Aster, president of Teldar Tech Inc., was reviewing the product profitability reports with the controller, Francie Newburn. The following conversation took place:

Aldin: I've been reviewing the product profitability reports. Our high-volume calculator, the T-100, appears to be unprofitable, while some of our lower-volume specialty calculators in the T-900 series appear to be very profitable. These results do not make sense to me. How are the product profits determined?

Francie: First, we identify the revenues associated with each product line. This information comes directly from our sales order system and is very accurate. Next, we identify the direct materials and direct labor associated with making each of the calculators. Again, this information is very accurate. The final cost that must be considered is the factory overhead. Factory overhead is allocated to the products, based on the direct labor hours used to assemble the calculator.

Aldin: What about distribution, promotion, and other post-manufacturing costs that can be associated with the product?

*Francie*: According to generally accepted accounting principles, we expense them in the period that they are incurred and do not treat them as product costs.

Aldin: Another thing, you say that you allocate factory overhead according to direct labor hours. Yet I know that the T-900 series specialty products have very low volumes but require extensive engineering, testing, and materials management effort. They are our newer, more complex products. It seems that these sources of factory overhead will end up being allocated to the T-100 line because it is the high-volume and therefore high direct labor hour product. Yet the T-100 line is easy to make and requires very little support from our engineering, testing, and materials management personnel.

Francie: I'm not too sure. I do know that our product costing approach is similar to that used by many different types of companies. I don't think we could all be wrong.

Is Aldin Aster's concern valid, and how might Francie Newburn redesign the cost allocation system to address Aldin's concern?

# CP 26-6 Allocating administrative costs for a service company



Banks have a variety of products, such as savings accounts, checking accounts, certificates of deposit (CDs), and loans. Assume that you were assigned the task of determining the administrative costs of "checking and savings accounts" as a complete product line. What are some of the activities associated with checking and savings accounts? In answering this question, consider the activities that you might perform with your checking and savings accounts. For each activity, what would be an activity base that could be used to allocate the activity cost to the checking and savings accounts product line?



# Lean Principles, Lean Accounting, and Activity Analysis

# Precor

hen you order the salad bar at the local restaurant, you are able to serve yourself at your own pace. There is no waiting for the waitress to take the order or for the cook to prepare the meal. You are able to move directly to the salad bar and select from various offerings. You might wish to have salad with lettuce, cole slaw, bacon bits, croutons, and salad dressing. The offerings are arranged in a row so that you can build your salad as you move down the salad bar.

Many manufacturers are producing products in much the same way that the salad bar is designed to satisfy each customer's needs. Like customers at the salad bar, products move through a production process as they are built for each customer. Such a process eliminates many sources of waste, which is why it is called *lean*.

Using lean practices can improve performance. For example, when **Precor**, a manufacturer of fitness equipment, used lean principles, it improved its manufacturing operations and achieved the following results:

- Increased on-time shipments from near 40% to above 90%.
- Decreased direct labor costs by 30%.
- Reduced the number of suppliers from 3,000 to under 250.
- Reduced inventory by 40%.
- Reduced warranty claims by almost 60%.

In this chapter, lean practices are described and illustrated. The chapter concludes by describing and illustrating the accounting for quality costs and activity analysis.

Learning Objectives				
After studying this chapter, you should be able to:  Describe lean manufacturing practices. Lean Principles Reducing Inventory Reducing Lead Times Reducing Setup Time Emphasizing Product-Oriented Layout Emphasizing Employee Involvement Emphasizing Pull Manufacturing Emphasizing Zero Defects Emphasizing Supply Chain Management	EE 27-1 EE 27-2			
Describe the implications of lean manufacturing on the accounting system.  Lean Accounting Fewer Transactions Combined Accounts Nonfinancial Performance Measures Direct Tracing of Overhead	EE 27-3 EE 27-3			
Describe and illustrate activity analysis for improving operations.  Activity Analysis  Costs of Quality  Quality Activity Analysis  Value-Added Activity Analysis  Process Activity Analysis	EE 27-4 EE 27-5			
At a Glance 27 Page 1263				



Lean enterprise
A business that
produces products
or services with high quality,
low cost, fast response, and
immediate availability using
lean principles.

# **Lean Principles**

The **lean enterprise** is a business that produces products or services with high quality, low cost, fast response, and immediate availability. **Lean manufacturing**, sometimes called *just-in-time processing (JIT)*, accomplishes these objectives in a manufacturing setting. Both manufacturing and nonmanufacturing businesses use **lean principles** to accomplish these service and cost objectives. However, these principles will be discussed within the context of lean manufacturing. Lean manufacturing principles are listed and contrasted with traditional manufacturing principles in Exhibit 1.

EXHIBIT 1 Lean versus Traditional Manufacturing Principles				
Issue	Lean Manufacturing	Traditional Manufacturing		
Inventory	Reduces inventory.	Increases inventory to protect against process problems.		
Lead time	Reduces lead time.	Increases lead time to protect against uncertainty.		
Setup time	Reduces setup time.	Disregards setup time as an improvement priority.		
Production layout	Emphasizes product-oriented layout.	Emphasizes process-oriented layout.		
Role of the employee	Emphasizes team-oriented employee involvement.	Emphasizes work of individuals, following manager instructions.		
Production scheduling policy	Emphasizes pull manufacturing.	Emphasizes push manufacturing.		
Quality	Emphasizes zero defects.	Tolerates defects.		
Suppliers and customers	Emphasizes supply chain management.	Treats suppliers and customers as "arm's-length," independent entities.		

## **Reducing Inventory**

Lean manufacturing views inventory as wasteful and unnecessary, and thus emphasizes reducing or eliminating inventory.

Under traditional manufacturing, inventory often hides underlying production problems. For example, if machine breakdowns occur, work in process inventories can be used to keep production running in other departments while the machines are being repaired. Likewise, inventories can be used to hide problems caused by a shortage of trained employees, unreliable suppliers, or poor product quality.

In contrast, lean manufacturing solves and removes production problems. In this way, raw materials, work in process, and finished goods inventories are reduced or eliminated.

The role of inventory in manufacturing can be illustrated using a river, as shown in Exhibit 2. Inventory is the water in a river. The rocks at the bottom of the river are production problems. When the water level (inventory) is high, the rocks (production problems) at the bottom of the river are hidden. As the water level (inventory) drops, the rocks (production problems) become visible, one by one. Lean manufacturing reduces the water level (inventory), exposes the rocks (production problems), and removes the rocks so that the river can flow smoothly.



#### **EXHIBIT 2**

Inventory's Role in Manufacturing

# Integrity, Objectivity, and Ethics in Business



#### THE INVENTORY SHIFT

Some managers take a shortcut to reducing inventory by shifting inventory to their suppliers. With this tactic, the hard work of improving processes is avoided. Enlightened managers realize that such tactics often have short-lived

savings. Suppliers will eventually increase their prices to compensate for the additional inventory holding costs, thus resulting in no savings. Therefore, shifting a problem doesn't eliminate a problem.

## **Reducing Lead Times**

**Lead time**, sometimes called *throughput time*, measures the time interval between a product entering production (is started) and when it is completed (finished). That is, lead time measures how long it takes to manufacture a product. To illustrate, in Exhibit 3, if a product enters production at 1:00 P.M. and is completed at 5:00 P.M., the lead time is four hours.

#### **EXHIBIT 3**

**Lead Time** 



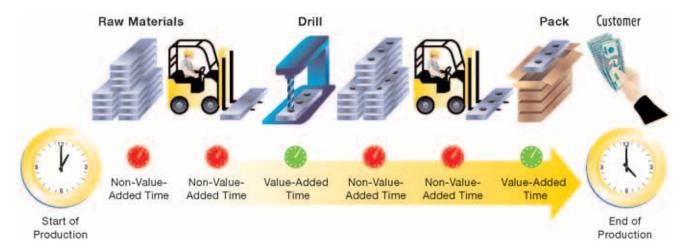
The lead time can be classified as one of the following:

- Value-added lead time, which is the time spent in converting raw materials into a finished unit of product
- Non-value-added lead time, which is the time spent while the unit of product is
  waiting to enter the next production process or is moved from one process to another

Exhibit 4 illustrates value-added and non-value-added lead time. The time spent drilling and packing the unit of product is value-added time. The time spent waiting to enter the next process or the time spent moving the unit of product from one process to another is non-value-added time.

#### **EXHIBIT 4**

#### **Components of Lead Time**



The value-added ratio is computed as follows:

$$Value-Added Ratio = \frac{Value-Added Lead Time}{Total Lead Time}$$

To illustrate, assume that the lead time to manufacture a unit of product is as follows (value-added times are highlighted):

Move raw materials to machining	5 minutes
Machining	35
Move time to assembly	10
Assembly	20
Move time to packing	
Wait time for packing	30
Packing	10
Total lead time	

The value-added ratio for the preceding product is 52%, computed as follows:

Value-Added Ratio = 
$$\frac{\text{Value-Added Lead Time}}{\text{Total Lead Time}}$$
  
=  $\frac{(35 + 20 + 10) \text{ minutes}}{125 \text{ minutes}} = \frac{65 \text{ minutes}}{125 \text{ minutes}} = 52\%$ 

A low value-added ratio indicates a poor manufacturing process. A good manufacturing process will reduce non-value-added lead time to a minimum and thus have a high value-added ratio.

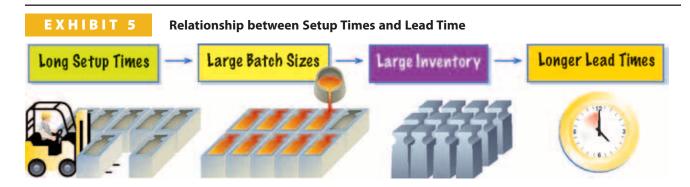
Lean manufacturing reduces or eliminates non-value-added time. In contrast, traditional manufacturing processes may have a value-added ratio as small as 5%.

Crown Audio reduced the lead time between

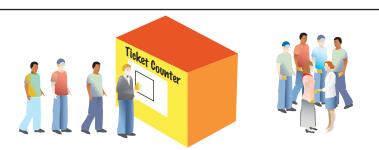
receiving and delivering a customer order from 30 days to 12 hours by using lean principles.

## **Reducing Setup Time**

A *setup* is the effort spent preparing an operation or process for production. A **batch size** is the amount of production in units of product that is produced after a setup. If setups are long and costly, the batch size for the related production run is normally large. Large batch sizes allow setup costs to be spread over more units and, thus, reduce the cost per unit. However, large batch sizes increase inventory and lead time. Exhibit 5 shows the relationship between setup times and lead time.



To help understand the relationship of batch sizes to lead-time, consider a group of 10 friends purchasing a ticket at a single-window ticket counter as shown in Exhibit 6.



**EXHIBIT 6** 

Batch Size and Lead Time

The friends are traveling together, so they are like a "batch" of production. If each friend takes one minute to purchase a ticket, the other nine friends are either waiting in line, or waiting for the remaining friends to finish. Thus, it takes 10 minutes for all of the friends to receive tickets as a group, but it took only one minute for any one friend to actually buy a ticket.

The amount of time each friend is waiting is called within-batch wait time. The total within-batch wait time is computed as follows:

Total Within-Batch Wait Time = (Value-Added Time)  $\times$  (Batch Size -1)

In this example, the value-added time is the 1 minute to purchase a ticket. So the total within-batch wait time is 9 minutes, computed as follows:

Total Within-Batch Wait Time = 1 minute  $\times$  (10 – 1) = 9 minutes

The value added ratio is 10%, computed as follows:

Value-Added Ratio = 
$$\frac{\text{Value-Added Lead Time}}{\text{Total Lead Time}}$$
  
=  $\frac{1 \text{ minute}}{10 \text{ minutes}} = 10\%$ 

Now consider someone buying a ticket without a group of friends present. A single person would only take one minute to buy the ticket, with no waiting for friends. In this case, the lead-time drops down to one minute, or simply the time to purchase the ticket, and the value-added ratio is 100%.

Lean manufacturing emphasizes decreasing setup times in order to reduce the batch size, whereas traditional manufacturing does not treat setup improvement as an important priority. By reducing batch sizes, work in process inventory and within-batch wait time decrease, thus reducing total lead-time and increasing the value-added ratio.

To illustrate in a manufacturing setting, assume that Automotive Components Inc. manufactures engine starters as follows (value-added times are highlighted):

	Processing Time per Unit
Move raw materials to Machining	5 minutes
Machining	7
Move time to Assembly	10
Assembly	9
Move time to Testing	10
Testing	8
Total	49 minutes
Batch size	40 units

The total lead time is 985 minutes, computed as follows:

Value-added time (7 + 9 + 8)	24 minutes
Move time (5 + 10 + 10)	25
Total within-batch wait time	936*
Total time	985 minutes

*Total Within-Batch Wait Time = (Value-Added Time)  $\times$  (Batch Size – 1) = (7 + 9 + 8) minutes  $\times$  (40 – 1) = 24 minutes  $\times$  39 = 936 minutes

Of the total lead time of 985 minutes, 24 minutes is value-added time and 961 minutes (985 - 24) is non-value-added time. The total non-value-added time of 961 minutes can also be determined as the sum of the total within-batch time of 936 minutes plus the move time of 25 minutes.

Based on the preceding data, the value-added ratio is approximately 2.4%, computed as follows:

Value-Added Ratio = 
$$\frac{\text{Value-Added Lead Time}}{\text{Total Lead Time}}$$
  
=  $\frac{(7+9+8) \text{ minutes}}{985 \text{ minutes}} = \frac{24 \text{ minutes}}{985 \text{ minutes}} = 2.4\% \text{ (rounded)}$ 

Thus, the non-value-added time for Automotive Components Inc. is approximately 97.6% (100% - 2.4%).

Automotive Components can increase its value-added ratio by reducing setups so that the batch size is one unit, called *one-piece flow*. Automotive Components could also move the Machining, Assembly, and Testing activities closer to each other so that the move time could be reduced. With these changes, Automotive Components' value-added ratio would increase.

Tech Industries improved an injection machine setup so that the number of process steps was reduced from 84 to 19 and the setup time was reduced from five

hours to one hour.



# Business Connection

#### P&G'S "PIT STOPS"

What do Procter & Gamble and Formula One racing have in common? The answer begins with P&G's Packing Department, which is where detergents and other products are filled on a "pack line." Containers move down the pack line and are filled with products from a packing machine. When it was time to change from a 36-oz. to a 54-oz. *Tide* box, for example, the changeover involved stopping the line, adjusting guide rails, retrieving items from the tool room, placing items back in the tool room, changing and cleaning the pack heads, and performing routine maintenance. Changing the pack line could be a very difficult process and typically took up to several hours.

Management realized that it was important to reduce this time significantly in order to become more flexible and cost efficient in packing products. Where could they learn how to do setups faster? They turned to Formula One racing, reasoning that a pit stop was much like a setup. As a result, P&G videotaped actual Formula One pit stops. These videos were used to form the following principles for conducting a fast setup:

- Position the tools near their point of use on the line prior to stopping the line, to reduce time going back and forth to the tool room.
- Arrange the tools in the exact order of work, so that no time is wasted looking for a tool.
- Have each employee perform a very specific task during the setup.
- Design the workflow so that employees don't interfere with each other.
- Have each employee in position at the moment the line is stopped.
- Train each employee, and practice, practice, practice.
- Put a stop watch on the setup process.
- Plot improvements over time on a visible chart.

As a result of these changes, P&G was able to reduce pack-line setup time from several hours to 20 minutes. This decrease allowed the company to reduce lead time and to improve the cost performance of the Packing Department.

## Example Exercise 27-1 Lead Time



The Helping Hands glove company manufactures gloves in the cutting and assembly process. Gloves are manufactured in 50-glove batch sizes. The cutting time is 4 minutes per glove. The assembly time is 6 minutes per glove. It takes 12 minutes to move a batch of gloves from cutting to assembly.

- a. Compute the value-added, non-value-added, and total lead time of this process.
- Compute the value-added ratio. Round to one decimal place.

## Follow My Example 27-1

a. Value-added lead time: 10 min. = (4 min. + 6 min.)

Non-value-added lead time:

Total within-batch wait time 490  $= (4 + 6) \text{ minutes} \times (50 - 1)$ 

Move time 12 Total lead time 512 min.

b. Value-added ratio:  $\frac{10 \text{ min.}}{512 \text{ min.}} = 2.0\%$  (rounded)

Practice Exercises: PE 27-1A, PE 27-1B

## **Emphasizing Product-Oriented Layout**

Manufacturing processes can be organized around a product, which is called a product-oriented layout (or product cells). Alternatively, manufacturing processes can be organized around a process, which is called a process-oriented layout.

Lean manufacturing normally organizes manufacturing around products rather than processes. Organizing work around products reduces:

- Moving materials and products between processes
- Work in process inventory
- Lead time
- Production costs

In addition, a product-oriented layout improves coordination among the various work activities, or operations, of the facility.

## **Emphasizing Employee Involvement**

Traditional manufacturing often values direct labor employees only for their manual labor, whereas lean manufacturing values labor for contributions beyond labor tasks, using employee involvement. **Employee involvement** is a management approach that grants employees the responsibility and authority to make decisions about operations. Employee involvement is often applied in lean manufacturing by organizing employees into *product cells*. Within each product cell, employees are organized as teams where the employees are cross-trained to perform any operation within the product cell.

To illustrate, employees learn how to operate several different machines within their product cell. In addition, team members are trained to perform functions traditionally performed by centralized service departments. For example, product cell employees may perform their own equipment maintenance, quality control, house-keeping, and improvement studies.

## **Emphasizing Pull Manufacturing**

**Pull manufacturing** (or *make to order*) is an important lean practice. In pull manufacturing, products are manufactured only as they are needed by the customer. Products can be thought of as being pulled through the manufacturing process. In other words, the status of the next operation determines when products are moved or produced. If the next operation is busy, production stops so that work in process does not pile up in front of the busy operation. When the next operation is ready, the product is moved to that operation.

A system used in pull manufacturing is *kanban*, which is Japanese for "cards." Electronic cards or containers signal production quantities to be filled by the preceding operation. The cards link the customer's order for a product back through each stage of production. In other words, when a consumer orders a product, a kanban card triggers the manufacture of the product.

In contrast, the traditional approach to manufacturing is based on estimated customer demand. This principle is called **push manufacturing** (or make to stock). In push manufacturing, products are manufactured according to a production schedule that is based upon estimated sales. The schedule "pushes" product into inventory before customer orders are received. As a result, push manufacturers normally have more inventory than pull manufacturers.

# **Emphasizing Zero Defects**

Lean manufacturing attempts to eliminate poor quality. Poor quality creates:

- Scrap
- · Rework, which is fixing product made wrong the first time
- Disruption in the production process
- Dissatisfied customers
- Warranty costs and expenses

One way to improve product quality and manufacturing processes is Six Sigma. **Six Sigma** was developed by **Motorola Corporation** and consists of five steps: define, measure, analyze, improve, and control (DMAIC). Since its development, Six Sigma has been adopted by thousands of organizations worldwide.

# **Emphasizing Supply Chain Management**

**Supply chain management** coordinates and controls the flow of materials, services, information, and finances with suppliers, manufacturers, and customers. Supply chain management partners with suppliers using long-term agreements. These agreements ensure that products are delivered with the right quality, at the right cost, at the right time.

¹ The term "six sigma" refers to a statistical property where a process has less than 3.4 defects per one million items.

To enhance the interchange of information between suppliers and customers, supply chain management often uses:

- Electronic data interchange (EDI), which uses computers to electronically communicate orders, relay information, and make or receive payments from one organization to another
- Radio frequency identification devices (RFID), which are electronic tags (chips) placed on or embedded within products that can be read by radio waves that allow instant monitoring of product location
- Enterprise resource planning (ERP) systems, which are used to plan and control internal and supply chain operations



# Business **Connection**

#### **LEAN MANUFACTURING IN ACTION**

- Yamaha manufactures musical instruments such as trumpets, horns, saxophones, clarinets, and flutes using product-oriented layouts.
- Sony uses employee involvement to organize employees into small four-person teams to completely assemble a camcorder, doing everything from soldering to testing. This team-based approach reduces assembly time from 70 minutes to 15 minutes per camcorder.
- Kenney Manufacturing Company, a manufacturer of window shades, estimated that 50% of its window shade process was non-value-added. By using **pull** manufacturing and changing the line layout, it was able to reduce inventory by 82% and lead time by 84%.
- Motorola has claimed over \$17 billion in savings from Six Sigma.
- Hyundia/Kia Motors Group will use 20 million RFID tags annually to track automotive parts from its suppliers, providing greater supply chain transparency and flexibility.

## **Lean Principles for Nonmanufacturing Processes**



All of the lean principles discussed for a manufacturer can be adapted to service businesses or administrative processes. Examples of service businesses that use lean principles include hospitals, banks, insurance companies, and hotels. Examples of administrative processes that use lean principles include processing of insurance applications, product designs, and sales orders. In the case of a service business, the "product" is normally the customer or patient. In the case of administrative processes, the "product" is normally information.

For example, a traditional accounting department delivers month-end financial statements using a sequential, process-oriented layout. Using lean principles, the lead time for producing financial statements can be reduced significantly by employing a product-oriented layout. In this case, the "products" are the individual inputs to financial statement consolidation from the payroll, accounts payable, and accounts receivable functions. A product layout may allow these inputs to be processed in parallel, rather than sequentially, thus reducing non-value-added lead time.

# Service Focus



#### **LEAN HEALTHCARE**

Lean principles can be used in many health care settings, from the patient admissions process to design of the operating room procedures. Lean principles applied to healthcare include reducing patient lead-time, enhancing employee involvement through patient care teams, improving quality, reducing medical supply inventory, and designing the hospital around a product-oriented layout. For example, a product-oriented layout can be employed by designing health care delivery around a particular patient class. Thus, X-Ray equipment can be placed near a patient class, such as emergency room (ER) patients, rather than inefficiently transporting ER patients to a centralized X-Ray department. A further example involves patient lead-time. An operating room (OR) can use lean principles to reduce the turn-around time (TAT). TAT is the amount of time consumed between finishing one patient and starting a second patient in the OR. It is similar to setup time in manufacturing. Hospital Corporation of America organized OR supplies in wheeled carts, "pulled" supplies into the OR, and improved team communication to reduce TAT, supply inventory, and OR space utilization.

Source: Glover, Wiljeana J., Van Aken, Eileen M., and Creehan, Kevin, "Case Study on Using Lean Principles to Improve Turnaround Time and First Case Starts in an Operating Room," Proceedings of the 2009 Society for Health Systems Conference and Expo.

## **Example Exercise 27-2** Lean Features

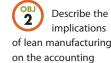
Which of the following are features of a lean manufacturing system?

- a. Reduced space
- b. Larger inventory
- c. Longer lead times
- d. Reduced setups

#### Follow My Example 27-2

- a. Reduced space
- d. Reduced setups

Practice Exercises: PE 27-2A, PE 27-2B



system.

# **Lean Accounting**

In lean manufacturing, the accounting system reflects the lean philosophy. Such systems are called **lean accounting**, and have the following characteristics:

- Fewer transactions. There are fewer transactions to record, thus simplifying the accounting system.
- Combined accounts. All in-process work is combined with raw materials to form a new
  account, Raw and In Process (RIP) Inventory. Direct labor is also combined with
  other costs to form a new account titled Conversion Costs.
- Nonfinancial performance measures. Nonfinancial performance measures are emphasized.
- *Direct tracing of overhead*. Indirect labor is directly assigned to product cells; thus, less factory overhead is allocated to products.

#### **Fewer Transactions**

The traditional process cost accounting system accumulates product costs by department. These costs are transferred from department to department as the product is manufactured. Thus, materials are recorded into and out of work in process inventories as the product moves through the factory.

The recording of product costs by departments facilitates the control of costs. However, this requires that many transactions and costs be recorded and reported. This adds cost and complexity to the cost accounting system.

In lean manufacturing, there is less need for cost control. This is because lower inventory levels make problems more visible. That is, managers don't need accounting reports to indicate problems because any problems become immediately known.

The lean accounting system uses **backflush accounting**. Backflush accounting simplifies the accounting system by eliminating the accumulation and transfer of product costs by departments, but instead, pulls material and conversion costs directly to finished goods. Thus, efficiency is gained by not transferring costs through intermediate departmental work in process accounts.

#### **Combined Accounts**

Materials are received directly by the product cells and enter immediately into production. Thus, there is no central materials inventory location (warehouse) or a materials account. Instead, lean accounting debits all materials and conversion costs to an account titled *Raw and In Process Inventory*. Doing so combines materials and work in process costs into one account.

Lean manufacturing often does not use a separate direct labor cost classification. This is because the employees in product cells perform many tasks. Some of these tasks could be classified as direct, such as performing operations, and some as indirect, such as performing repairs. Thus, labor cost (direct and indirect) is combined with other product cell overhead costs and recorded in an account titled *Conversion Costs*.

To illustrate, assume the following data for Anderson Metal Fabricators, a manufacturer of metal covers for electronic test equipment:

The cell conversion cost rate is determined as follows:

Cell Conversion Cost Rate = 
$$\frac{\text{Budgeted Conversion Cost}}{\text{Planned Hours of Production}}$$
  
=  $\frac{\$2,400,000}{1,920 \text{ hours}}$  =  $\$1,250 \text{ per hour}$ 

The cell conversion rate is similar to a predetermined factory overhead rate, except that it includes all conversion costs in the numerator.

Assume that Anderson Metal's cover product cell is expected to require 0.02 hour of manufacturing time per unit. Thus, the conversion cost for the cover is \$25 per unit, computed as follows:

Conversion Cost for Cover = Manufacturing Time  $\times$  Cell Conversion Cost Rate = 0.02 hour  $\times$  \$1,250 = \$25 per unit

The recording of selected lean accounting transactions for Anderson Metal Fabricators for April is illustrated in Exhibit 7.

#### EXHIBIT 7

#### **Transactions Using Lean Accounting—Anderson Metal Fabricators**

Transaction	Journal Entry		Comment
Steel coil is purchased for producing 8,000 covers. The purchase cost was \$120,000, or \$15 per unit.	Raw and In Process Inventory	120,000	Note that the materials purchased are debited to the combined account, Raw and In Process Inventory. A separate materials account is not used, because materials are received directly in the product cells, rather than in an inventory location.
Conversion costs are applied to 8,000 covers at a rate of \$25 per cover.	Raw and In Process Inventory	200,000	The raw and in process inventory account is used to accumulate the applied cell conversion costs during the period. The credit to Conversion Costs is similar to the treatment of applied factory overhead.
All 8,000 covers were completed in the cell. The raw and in process inventory account is reduced by the \$15 per unit materials cost and the \$25 per unit conversion cost.	Finished Goods Inventory	320,000	$\begin{tabular}{lll} Materials ($15 \times 8,000 units) & $120,000 \\ Conversion ($25 \times 8,000 units) & $200,000 \\ \hline Total & $\frac{5320,000}{$320,000} \\ \hline After the cost of the completed units is transferred from the raw and in process inventory account, the account's balance is zero. There are no units left in process within the cell. 2 This is a backflush transaction. \\ \end{tabular}$
Of the 8,000 units completed, 7,800 were sold and shipped to customers at \$70 per unit, leaving 200 finished units in stock. Thus, the finished goods inventory account has a balance of \$8,000 (200 × \$40).	Accounts Receivable	546,000 312,000	Units sold         7,800           Conversion and materials         × \$40           cost per unit         Transferred to Cost of Goods Sold         \$312,000

²The actual conversion cost per unit may be different from the budgeted conversion cost per unit due to cell inefficiency, improvements in processing methods, or excess scrap. These deviations from the budgeted cost can be accounted for as cost variances, as illustrated in more advanced texts.

## Example Exercise 27-3 Lean Accounting



The budgeted conversion costs for a lean cell are \$142,500 for 1,900 production hours. Each unit produced by the cell requires 10 minutes of cell process time. During the month, 1,050 units are manufactured in the cell. The estimated materials cost is \$46 per unit. Provide the following journal entries:

- a. Materials are purchased to produce 1,100 units.
- b. Conversion costs are applied to 1,050 units of production.
- c. 1,030 units are completed and placed into finished goods.

E	ollow My Example 27-3		
	bilow My Example 27-3		
a.	Raw and In Process Inventory  Accounts Payable  *\$46 per unit × 1,100 units		50,600
b.	Raw and In Process Inventory Conversion Costs $*[(\$142,500 \div 1,900 \text{ hours}) \times (10 \text{ min.} \div 60 \text{ min.})] = \$12.50 \text{ per unit; } \$12.50 \times 1,050 \text{ units} = \$13,125 \times 1,050 \text{ min.}$		13,125
c.	Finished Goods Inventory		60,255
•••••		Practice Exer	cises: PE 27-3A, PE 27-3B

#### **Nonfinancial Performance Measures**

Lean manufacturing normally uses nonfinancial measures to help guide short-term operating performance. A **nonfinancial measure** is operating information not stated in dollar terms. Examples of nonfinancial measures of performance include:

- Lead time
- Value-added ratio
- Setup time
- Number of production line stops
- Number of units scrapped
- Deviations from scheduled production
- Number of failed inspections

Most companies use a combination of financial and nonfinancial operating measures, which are often referred to as *key performance indicators* (or *KPIs*). Nonfinancial measures are often available more quickly than financial measures. Thus, nonfinancial measures are often used for day-to-day operating decisions that require quick feedback. In contrast, traditional financial accounting measures are often used for longer-term operating decisions.

# **Direct Tracing of Overhead**

In lean manufacturing, many indirect tasks are assigned to a product cell. For example, maintenance department personnel may be assigned to a product cell and cross-trained to perform other operations. Thus, the salary of maintenance personnel can be traced directly to the product cell, and thus, to the product.

In traditional manufacturing, maintenance personnel are part of the maintenance department. The cost of the maintenance department is then allocated to products based on predetermined factory overhead rates. Such allocations are not necessary when maintenance personnel are assigned directly to a product cell.

# **Activity Analysis**

In Chapter 26, we discussed activity-based costing for product costing. Activities can also be used to support operational improvement in the lean enterprise using activity analysis. **Activity analysis** determines the cost of activities for the purpose of determining the cost of the following:

Describe and illustrate activity analysis for improving operations.

- Quality
- Value-added activities
- Processes

## **Costs of Quality**

Competition encourages businesses to emphasize high-quality products, services, and processes. In doing so, businesses incur **costs of quality**, as illustrated in Exhibit 8. These costs of quality can be classified as follows:

Prevention costs, which are costs of preventing defects before or during the manufacture of the product or delivery of services

Examples: Costs of engineering good product design, controlling vendor quality, training equipment operators, maintaining equipment

• **Appraisal costs**, which are costs of activities that detect, measure, evaluate, and inspect products and processes to ensure that they meet customer needs

Examples: Costs of inspecting and testing products

 Internal failure costs, which are costs associated with defects discovered before the product is delivered to the consumer

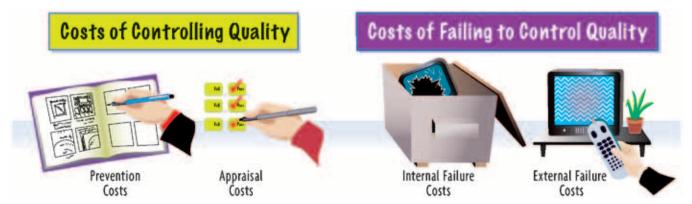
Examples: Cost of scrap and rework

• External failure costs, which are costs incurred after defective products have been delivered to consumers

Examples: Cost of recalls and warranty work

**EXHIBIT 8** 

**Costs of Quality** 



Prevention and appraisal costs can be thought of as costs of controlling quality *before* any products are known to be defective. Internal and external failure costs can be thought of as the cost of controlling quality *after* products have become defective. Internal and external failure costs also can be thought of as the costs of "failing to control quality" through prevention and appraisal efforts.

Prevention and appraisal costs are incurred *before* the product is manufactured or delivered to the customer. Prevention costs are incurred in an attempt to permanently improve product quality. In contrast, appraisal costs are incurred in an attempt to limit the amount of defective products that "slip out the door."

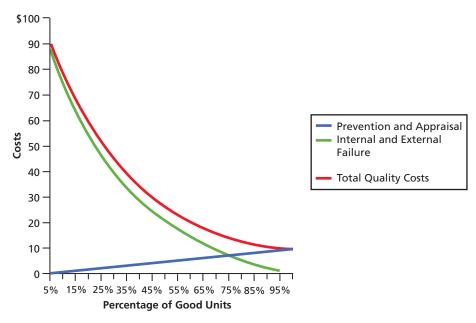
Internal and external failure costs are incurred *after* the defective products have been discovered. In addition to costs of scrap and rework, internal failure costs may be incurred for lost equipment time because of rework and the costs of carrying additional inventory used for reworking. In addition to costs of recall and warranty work, external

failure costs include the loss of customer goodwill. Although the loss of customer goodwill is difficult to measure, it may be the largest and most important quality control cost.

The relationship between the costs of quality is shown in Exhibit 9. The graph in Exhibit 9 indicates that as prevention and appraisal costs (blue line) increase, the percent of good units increases. In contrast, as internal and external failure costs (green line) decrease, the percent of good units increases. Total quality cost (red line) is the sum of the prevention/appraisal costs and internal/external failure costs.

#### **EXHIBIT 9**

#### The Relationship between the Costs of Quality



The optimal level of quality (percent of good units) is the one that minimizes the total quality costs. At this point, prevention and appraisal costs are balanced against internal and external failure costs. Exhibit 9 indicates that the optimal level of quality occurs at (or near) 100% quality. This is because prevention and appraisal costs grow moderately as quality increases. However, the costs of internal and external failure drop dramatically as quality increases.

## **Quality Activity Analysis**

An activity analysis of quality quantifies the costs of quality in dollar terms. To illustrate, the quality control activities, activity costs, and quality cost classifications for Gifford Company, a consumer electronics company, are shown in Exhibit 10.

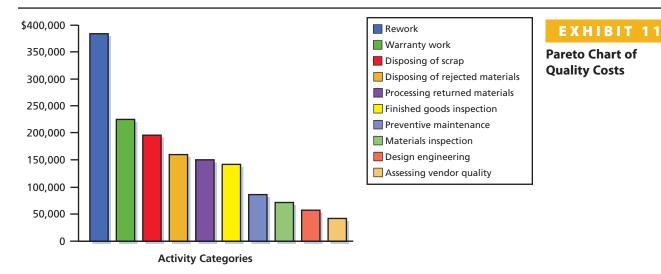
#### EXHIBIT 10

Quality Control Activity Analysis— Gifford Company

Quality Control Activities	Activity Cost	Quality Cost Classification
Design engineering	\$ 55,000	Prevention
Disposing of rejected materials	160,000	Internal Failure
Finished goods inspection	140,000	Appraisal
Materials inspection	70,000	Appraisal
Preventive maintenance	80,000	Prevention
Processing returned materials	150,000	External Failure
Disposing of scrap	195,000	Internal Failure
Assessing vendor quality	45,000	Prevention
Rework	380,000	Internal Failure
Warranty work	225,000	External Failure
Total activity cost	\$1,500,000	

**Pareto Chart of Quality Costs** One method of reporting quality cost information is using a Pareto chart. A **Pareto chart** is a bar chart that shows the totals of an attribute for a number of categories. The categories are ranked and shown left to right, so that the largest total attribute is on the left and the smallest total is on the right.

To illustrate, Exhibit 11 is a Pareto chart for the quality control activities in Exhibit 10.



In Exhibit 11, the vertical axis is dollars, which represents quality control costs. The horizontal axis represents activity categories, which are the ten quality control cost activities. The ten quality control cost categories are ranked from the one with the largest total on the left to the one with the smallest total on the right. Thus, the largest bar on the left is rework costs (\$380,000), the second bar is warranty work (\$225,000), and so on.

The Pareto chart gives managers a quick visual tool for identifying the most important quality control cost categories. Exhibit 11 indicates that Gifford Company should focus efforts on reducing rework and warranty costs.

**Cost of Quality Report** The costs of quality also can be summarized in a cost of quality report. A **cost of quality report** normally reports the following:

- Total activity cost for each quality cost classification
- Percent of total quality costs associated with each classification
- Percent of each quality cost classification to sales

Exhibit 12 is a cost of quality report for Gifford Company, based on assumed sales of \$5,000,000. Exhibit 12 indicates that only 12% of the total quality cost is the cost of preventing quality problems, while 14% is the cost of appraisal activities. Thus, prevention and appraisal costs make up only 26% of the total quality control costs. In contrast, 74% (49% + 25%) of the quality control costs are incurred for internal (49%) and external failure (25%) costs. In addition, internal and external failure costs are 22.2% (14.7% + 7.5%) of sales.

Exhibit 12 implies that Gifford Company is not spending enough on prevention and appraisal activities. By spending more on prevention and appraisal, internal and external failure costs will decrease, as was shown in Exhibit 9.

#### **EXHIBIT 12**

Cost of Quality Report—Gifford Company

Gifford Company Cost of Quality Report			
Quality Cost	Percent of Total  Quality Cost	Percent of Total Sales	
\$ 180,000	12%	3.6%	
210,000	14	4.2	
735,000	49	14.7	
375,000	25	7.5	
\$1,500,000	100%	30.0%	
	Quality Cost \$ 180,000 210,000 735,000 375,000	Cost of Quality Report	

# Example Exercise 27-4 Cost of Quality Report



A quality control activity analysis indicated the following four activity costs of an administrative department:

Verifying the accuracy of a form	\$ 50,000
Responding to customer complaints	100,000
Correcting errors in forms	75,000
Redesigning forms to reduce errors	25,000
Total	\$250,000

Sales are \$2,000,000. Prepare a cost of quality report.

### Follow My Example 27-4

Cost of	Quality	/ Report
---------	---------	----------

Quality Cost Classification	Quality Cost	Percent of Total Quality Cost	Percent of Total Sales
Prevention	\$ 25,000	10%	1.25%
Appraisal	50,000	20	2.50
Internal failure	75,000	30	3.75
External failure	100,000	40	5.00
Total	\$250,000	100%	12.50%

Practice Exercises: PE 27-4A, PE 27-4B

# **Value-Added Activity Analysis**

In the preceding section, the quality control activities of Gifford Company were classified as prevention, appraisal, internal failure, and external failure activities. Activities also may be classified as follows:

- Value-added
- Non-value-added

A value-added activity is one that is necessary to meet customer requirements. A non-value-added activity is *not* required by the customer but occurs because of mistakes, errors, omissions, and process failures.

To illustrate, Exhibit 13 shows the value-added and non-value-added classification for the quality control activities for Gifford Company.³ This exhibit also reveals

³ We use the quality control activities for illustrating the value-added and non-value-added activities in this section. However, a value-added/non-value-added activity analysis can be done for any activity in a business, not just quality control activities.

<b>Quality Control Activities</b>	Activity Cost	Classification
Design engineering	\$ 55,000	Value-added
Disposing of rejected materials	160,000	Non-value-added
Finished goods inspection	140,000	Value-added
Materials inspection	70,000	Value-added
Preventive maintenance	80,000	Value-added
Processing returned materials	150,000	Non-value-added
Disposing of scrap	195,000	Non-value-added
Assessing vendor quality	45,000	Value-added
Rework	380,000	Non-value-added
Warranty work	225,000	Non-value-added
Total activity cost	\$1,500,000	

**EXHIBIT 13** 

Value-Added/ Non-Value-Added Quality Control Activities

that internal and external failure costs are classified as non-value-added. In contrast, prevention and appraisal costs are classified as value-added.⁴

A summary of the value-added and non-value-added activities follows. The summary expresses value-added and non-value-added costs as a percent of total costs.

Classification	Amount	Percent	
Value-added	\$ 390,000	26%	
Non-value-added	1,110,000	74	
Total	\$1,500,000	100%	

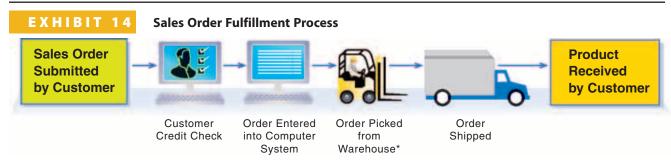
The preceding summary indicates that 74% of Gifford Company's quality control activities are non-value-added. This should motivate Gifford Company to make improvements to reduce non-value-added activities.

## **Process Activity Analysis**

Activity analysis can be used to evaluate business processes. A **process** is a series of activities that converts an input into an output. In other words, a process is a set of activities linked together by inputs and outputs. Common business processes include the following:

- Procurement
- Product development
- Manufacturing
- Distribution
- Sales order fulfillment

Exhibit 14 shows a sales order fulfillment process for Masters Company. This process converts a customer order (the input) into a product received by the customer (the output).



^{*}Operators driving forklifts receive a list of orders, drive to stacking locations within the warehouse, pick the orders, and then transport them back to an area to prepare for shipment.

⁴ Some believe that appraisal costs are non-value-added. They argue that if the product had been made correctly, then no inspection would be required. We take a less strict view and assume that appraisal costs are value-added.

Exhibit 14 indicates that Masters Company's sales order fulfillment process has the following four activities:

· Customer credit check

- Order picked from warehouse
- Order entered into computer system
- Order shipped

A process activity analysis can be used to determine the cost of the preceding activities. To illustrate, assume that a process activity analysis determines that the cost of the four activities is as follows:

Sales Order Fulfillment Activities	Activity Cost	Percent of Total Process Cost	
Customer credit check	\$14,400	18%	
Order entered into computer system	9,600	12	
Order picked from warehouse	36,000	45	
Order shipped	20,000	25	
Total sales order fulfillment process cost	\$80,000	100%	

If 10,000 sales orders are filled during the current period, the per-unit process cost is \$8 per order ( $$80,000 \div 10,000$  orders).

Management can use process activity analysis to improve a process. To illustrate, assume that Masters Company sets a cost improvement target of \$6 per order. A \$2 reduction per order (\$8 - \$6) requires improving efficiency or eliminating unnecessary activities.

Masters Company determines that only *new* customers need to have a credit check. If this change is made, it is estimated that only 25% of sales orders would require credit checks. In addition, by revising the warehouse product layout, it is estimated that the cost of picking orders can be reduced by 35%.

Assuming that 10,000 orders will be filled, the cost savings from these two improvements are as follows:

Sales Order Fulfillment Activities	Activity Cost Prior to Improvement	Activity Cost After Improvement	Activity Cost Savings
Customer credit check	\$14,400	\$ 3,600*	\$10,800
Order entered in computer system	9,600	9,600	0
Order picked from warehouse	36,000	23,400**	12,600
Order shipped	20,000	20,000	0
Total sales order fulfillment process cost	\$80,000	\$56,600	\$23,400
10,000 orders)	\$8.00	\$5.66	

^{*\$14,400 × 25%} 

As illustrated, the activity changes generate a savings of \$23,400.⁵ In addition, the cost per order is reduced to \$5.66, which is less than the \$6.00 per order targeted cost.⁶

## Example Exercise 27-5 Process Activity Analysis



Mason Company incurred an activity cost of \$120,000 for inspecting 50,000 units of production. Management determined that the inspecting objectives could be met without inspecting every unit. Therefore, rather than inspecting 50,000 units of production, the inspection activity was limited to 20% of the production. Determine the inspection activity cost per unit on 50,000 units of total production both before and after the improvement.

(Continued)

^{** \$36,000 - (\$36,000 × 35%)} 

⁵This analysis assumes that the activity costs are variable to the inputs and outputs of the process. While this is likely true for processes primarily using labor, such as a sales order fulfillment process, other types of processes may have significant fixed costs that would not change with changes of inputs and outputs.

⁶ Process activity analysis also can be integrated into a company's budgeting system using flexible budgets. Process activity analysis used in this way is discussed in advanced texts.

### Follow My Example 27-5

Inspection activity before improvement:  $$120,000 \div 50,000 \text{ units} = $2.40 \text{ per unit Inspection activity after improvement:}$ 

Revised inspection cost
Revised inspection cost per unit

 $(20\% \times 50,000 \text{ units}) \times $2.40 \text{ per unit} = $24,000}$ \$24,000 ÷ 50,000 units = \$0.48 per unit

Practice Exercises: PE 27-5A, PE 27-5B

## At a Glance 27



#### **Describe Lean manufacturing principles.**

**Key Points** Lean manufacturing emphasizes reduced lead time, a product-oriented production layout, a team-oriented work environment, setup time reduction, pull manufacturing, high quality, and supplier and customer partnering in order to improve the supply chain.

Learning Outcomes	Example Exercises	Practice Exercises
<ul> <li>Describe the relationships among setup time, batch size, inventory, and lead time.</li> </ul>		
• Compute lead time and the value-added ratio.	EE27-1	PE27-1A, 27-1B
• Identify the characteristics of a lean manufacturing environment and compare it to traditional approaches.	EE27-2	PE27-2A, 27-2B



#### Describe the implications of lean manufacturing on the accounting system.

**Key Points** Under lean manufacturing, the lean accounting system will have fewer transactions, will combine the materials and work in process accounts, and will account for direct labor as a part of cell conversion cost. Lean accounting will use nonfinancial reporting measures and result in more direct tracing of factory overhead to product cells.

Learning Outcomes	Example Exercises	Practice Exercises
• Identify the implications of the lean philosophy for lean accounting.		
• Prepare lean accounting journal entries for material purchases, application of cell conversion cost, and transfer of cell costs to finished goods.	EE27-3	PE27-3A, 27-3B
Describe nonfinancial performance measures.		



#### Describe and illustrate activity analysis for improving operations.

**Key Points** Companies use activity analysis to identify the costs of quality, which include prevention, appraisal, internal failure, and external failure costs. The quality cost activities may be reported on a Pareto chart or quality cost report. An alternative method for categorizing activities is by value-added and non-value-added classifications. An activity analysis also can be used to improve the cost of processes.

Learning Outcomes	Example Exercises	Practice Exercises
• Define the costs of quality.		
• Define and prepare a Pareto chart.		
• Prepare a cost of quality report.	EE27-4	PE27-4A, 27-4B
• Identify value-added and non-value-added activity costs.		
• Use process activity analysis to measure process improvement.	EE27-5	PE27-5A, 27-5B

## **Key Terms**

activity analysis (1257)
appraisal costs (1257)
backflush accounting (1254)
batch size (1249)
conversion costs (1254)
cost of quality report (1259)
costs of quality (1257)
electronic data interchange
(EDI) (1253)
employee involvement (1252)
enterprise resource planning
(ERP) (1253)
external failure costs (1257)

internal failure costs (1257) lead time (1247) lean accounting (1254) lean enterprise (1246) lean manufacturing (1246) lean principles (1246) nonfinancial measure (1256) non-value-added activity (1260) non-value-added lead time (1248) Pareto chart (1259) prevention costs (1257) process (1262) process-oriented layout (1251)
product-oriented layout (1251)
pull manufacturing (1252)
push manufacturing (1252)
radio frequency identification
devices (RFID) (1253)
Raw and In Process (RIP)
Inventory (1254)
Six Sigma (1252)
supply chain management (1252)
value-added activity (1260)
value-added lead time (1248)
value-added ratio (1248)

## **Illustrative Problem**

Krisco Company operates under the lean philosophy. As such, it has a production cell for its microwave ovens. The conversion cost for 2,400 hours of production is budgeted for the year at \$4,800,000.

During January, 2,000 microwave ovens were started and completed. Each oven requires six minutes of cell processing time. The materials cost for each oven is \$100.

#### **Instructions**

Use lean accounting to:

- 1. Determine the budgeted cell conversion cost per hour.
- 2. Determine the manufacturing cost per unit.
- 3. Journalize the entry to record the costs charged to the production cell in January.
- 4. Journalize the entry to record the costs transferred to finished goods.

#### **Solution**

- 1. Budgeted Cell Conversion Cost Rate =  $\frac{$4,800,000}{2,400 \text{ hours}}$  = \$2,000 per cell hour
- 2. Materials \$100 per unit Conversion cost [(\$2,000 per hour  $\div$  60 min.)  $\times$  6 min.]  $\times$  6 min.] Total \$300 per unit

3.	Raw and In Process Inventory Accounts Payable To record materials costs. (2,000 units × \$100 per unit)	200,000	200,000
	Raw and In Process Inventory  Conversion Costs  To record conversion costs.  (2,000 units × \$200 per unit)	400,000	400,000
4.	Finished Goods (2,000 × \$300 per unit)  Raw and In Process Inventory  To record finished production.	600,000	600,000

## **Discussion Questions**

- 1. What is the benefit of the lean philosophy?
- 2. What are some examples of non-value-added lead time?
- 3. Why is a product-oriented layout preferred by lean manufacturers over a process-oriented layout?
- 4. How is setup time related to lead time?
- 5. Why do lean manufacturers favor pull or "make to order" manufacturing?
- 6. Why would a lean manufacturer strive to produce zero defects?
- 7. How is supply chain management different from traditional supplier and customer relationships?

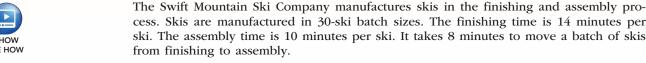
- 8. Why does lean accounting result in fewer transactions?
- 9. Why do lean manufacturers use a "raw and in process inventory" account, rather than separately reporting materials and work in process?
- 10. Why is the direct labor cost category eliminated in many lean manufacturing environments?
- 11. How does a Pareto chart assist management?
- 12. What is the benefit of identifying non-value-added activities?
- 13. What ways can the cost of a process be improved?

## **Practice Exercises**

**EE 27-1** p. 1251

#### PE 27-1A Lead time

OBJ. 1



- a. Compute the value-added, non-value-added, and total lead time of this process.
- b. Compute the value-added ratio. Round to one decimal place.

**EE 27-1** p. 1251

#### PE 27-1B Lead time

OBJ. 1

The Texas Jean Company manufactures jeans in the cutting and sewing process. Jeans are manufactured in 100-jean batch sizes. The cutting time is 11 minutes per jean. The sewing time is 8 minutes per jean. It takes 15 minutes to move a batch of jeans from cutting to sewing.

- a. Compute the value-added, non-value-added, and total lead time of this process.
- b. Compute the value-added ratio. Round to one decimal place.



#### **EE 27-2** *p. 1254* **PE 27-2A Lean features**

OBJ. 1



Which of the following are features of a lean manufacturing system?

- a. Production pace matches demand
- b. Centralized work in process inventory locations
- c. Push scheduling
- d. Receive raw materials directly to manufacturing cells

#### **EE 27-2** p. 1254

#### PE 27-2B Lean features

OBJ. 1



Which of the following are features of a lean manufacturing system?

- a. Centralized maintenance areas
- b. Smaller batch sizes
- c. Employee involvement
- d. Less wasted movement of material and people

#### **EE 27-3** p. 1256

#### PE 27-3A Lean accounting

OBJ. 2



The annual budgeted conversion costs for a lean cell are \$663,000 for 1,950 production hours. Each unit produced by the cell requires 15 minutes of cell process time. During the month, 665 units are manufactured in the cell. The estimated materials costs are \$160 per unit. Provide the following journal entries:

- a. Materials are purchased to produce 700 units.
- b. Conversion costs are applied to 665 units of production.
- c. 650 units are completed and placed into finished goods.

#### **EE 27-3** *p. 1256*

#### PE 27-3B Lean accounting

OBJ. 2



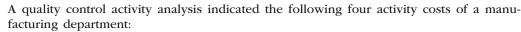
The annual budgeted conversion costs for a lean cell are \$144,000 for 1,800 production hours. Each unit produced by the cell requires 9 minutes of cell process time. During the month, 1,000 units are manufactured in the cell. The estimated materials costs are \$65 per unit. Provide the following journal entries:

- a. Materials are purchased to produce 1,050 units.
- b. Conversion costs are applied to 1,000 units of production.
- c. 980 units are completed and placed into finished goods.

#### **EE 27-4** p. 1260

#### **PE 27-4A** Cost of quality report

**OBJ. 3** 





Rework	\$ 39,000
Inspecting incoming raw materials	51,000
Warranty work	27,000
Process improvement effort	183,000
Total	\$300,000

Sales are \$1,000,000. Prepare a cost of quality report. Round percents to one decimal place.

#### **EE 27-4** p. 1260

#### PE 27-4B Cost of quality report

OBJ. 3



A quality control activity analysis indicated the following four activity costs of a hotel:

Inspecting cleanliness of rooms	\$ 108,000
Processing lost customer reservations	450,000
Rework incorrectly prepared room service meal	54,000
Employee training	288,000
Total	\$900,000

Sales are \$3,000,000. Prepare a cost of quality report.

#### **EE 27-5** p. 1262

#### PE 27-5A Process activity analysis

OBJ. 3



Lexter Company incurred an activity cost of \$180,000 for inspecting 25,000 units of production. Management determined that the inspecting objectives could be met without inspecting every unit. Therefore, rather than inspecting 25,000 units of production, the inspection activity was limited to 40% of the production. Determine the inspection activity cost per unit on 25,000 units of total production both before and after the improvement.

#### **EE 27-5** *p. 1262*

#### PE 27-5B Process activity analysis

OBJ. 3



Boswell Company incurred an activity cost of \$68,000 for inspecting 16,000 units of production. Management determined that the inspecting objectives could be met without inspecting every unit. Therefore, rather than inspecting 16,000 units of production, the inspection activity was limited to a random selection of 3,200 units out of the 16,000 units of production. Determine the inspection activity cost per unit on 16,000 units of total production both before and after the improvement.

### **Exercises**

#### EX 27-1 Lean principles

The chief executive officer (CEO) of Platnum Inc. has just returned from a management seminar describing the benefits of the lean philosophy. The CEO issued the following statement after returning from the conference:

This company will become a lean manufacturing company. Presently, we have too much inventory. To become lean, we need to eliminate the excess inventory. Therefore, I want all employees to begin reducing inventories until we make products "just-in-time." Thank you for your cooperation.



How would you respond to the CEO's statement?

#### EX 27-2 Lean as a strategy

OBJ, 1

The American textile industry has moved much of its operations offshore in the pursuit of lower labor costs. Textile imports have risen from 2% of all textile production in 1962 to over 70% in 2012. Offshore manufacturers make long runs of standard mass-market apparel items. These are then brought to the United States in container ships, requiring significant time between original order and delivery. As a result, retail customers must accurately forecast market demands for imported apparel items.

Assuming that you work for a U.S.-based textile company, how would you recommend responding to the low-cost imports?

#### EX 27-3 Lean principles

OBJ. 1

Active Apparel Company manufactures various styles of men's casual wear. Shirts are cut and assembled by a workforce that is paid by piece rate. This means that they are paid according to the amount of work completed during a period of time. To illustrate, if the piece rate is \$0.15 per sleeve assembled, and the worker assembles 700 sleeves during the day, then the worker would be paid \$105 (700  $\times$  \$0.15) for the day's work.

The company is considering adopting a lean manufacturing philosophy by organizing work cells around various types of products and employing pull manufacturing. However, no change is expected in the compensation policy. On this point, the manufacturing manager stated the following:

"Piecework compensation provides an incentive to work fast. Without it, the workers will just goof off and expect a full day's pay. We can't pay straight hourly wages—at least not in this industry."

How would you respond to the manufacturing manager's comments?

#### **EX 27-4** Lead time analysis

OBJ. 1

Palm Pals Inc. manufactures toy stuffed animals. The direct labor time required to cut, sew, and stuff a toy is 12 minutes per unit. The company makes two types of stuffed toys—a lion and a bear. The lion is assembled in lot sizes of 40 units per batch, while the bear is assembled in lot sizes of 5 units per batch. Since each product has direct labor time of 12 minutes per unit, management has determined that the lead time for each product is 12 minutes.

Is management correct? What are the lead times for each product?

#### EX 27-5 Reduce setup time

OBJ, 1

Hammond Inc. has analyzed the setup time on its computer-controlled lathe. The setup requires changing the type of fixture that holds a part. The average setup time has been 135 minutes, consisting of the following steps:

Turn off machine and remove fixture from lathe	10 minutes
Go to tool room with fixture	15
Record replacement of fixture to tool room	18
Return to lathe	20
Clean lathe	15
Return to tool room	20
Record withdrawal of new fixture from tool room	12
Return to lathe	15
Install new fixture and turn on machine	<u>10</u>
Total setup time	135 minutes

- a. Why should management be concerned about improving setup time?
- b. What do you recommend to Hammond Inc. for improving setup time?
- c. How much time would be required for a setup, using your suggestion in (b)?

#### EX 27-6 Calculate lead time

OBJ. 1

Flint Fabricators Inc. machines metal parts for the automotive industry. Under the traditional manufacturing approach, the parts are machined through two processes: milling and finishing. Parts are produced in batch sizes of 30 parts. A part requires 5 minutes in milling and 7 minutes in finishing. The move time between the two operations for a complete batch is 5 minutes.

Under the lean philosophy, the part is produced in a cell that includes both the milling and finishing operations. The operating time is unchanged; however, the batch size is reduced to 4 parts and the move time is eliminated.

Determine the value-added, non-value-added, and total lead times, and the value-added ratio under the traditional and lean manufacturing methods. Round percentages to one decimal place.

#### EX 27-7 Calculate lead time

OBJ. 1

Williams Optical Inc. is considering a new lean product cell. The present manufacturing approach produces a product in four separate steps. The production batch sizes are 45 units. The process time for each step is as follows:

Process Step 1	5 minutes
Process Step 2	8 minutes
Process Step 3	4 minutes
Process Step 4	3 minutes





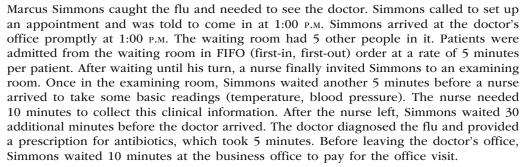
✓ b. Non-valueadded, 50 minutes The time required to move each batch between steps is 5 minutes. In addition, the time to move raw materials to Process Step 1 is also 5 minutes, and the time to move completed units from Process Step 4 to finished goods inventory is 5 minutes.

The new lean layout will allow the company to reduce the batch sizes from 45 units to 3 units. The time required to move each batch between steps and the inventory locations will be reduced to 2 minutes. The processing time in each step will stay the same.

Determine the value-added, non-value-added, and total lead times, and the value-added ratio under the (a) present and (b) proposed production approaches. Round percentages to one decimal place.

#### EX 27-8 Lead time calculation for a service company

OBJ. 1



Simmons spent 5 minutes walking next door to fill the prescription at the pharmacy. There were four people in front of Simmons, each person requiring 5 minutes to fill and purchase a prescription. Simmons arrived home 15 minutes after paying for his prescription.

- a. What time does Simmons arrive home?
- b. How much of the total elapsed time from 1:00 P.M. until when Simmons arrived home was non-value-added time?
- c. What is the value-added ratio?
- d. Why does the doctor require patients to wait so long for service?

#### EX 27-9 Suppy chain management

OBJ. 1

The following is an excerpt from a recent article discussing supplier relationships with the Big Three North American automakers.

"The Big Three select suppliers on the basis of lowest price and annual price reductions," said Neil De Koker, president of the Original Equipment Suppliers Association. "They look globally for the lowest parts prices from the lowest cost countries," De Koker said. "There is little trust and respect. Collaboration is missing." Japanese auto makers want long-term supplier relationships. They select suppliers as a person would a mate. The Big Three are quick to beat down prices with methods such as electronic auctions or rebidding work to a competitor. The Japanese are equally tough on price but are committed to maintaining supplier continuity. "They work with you to arrive at a competitive price, and they are willing to pay because they want long-term partnering," said Carl Code, a vice president at Ernie Green Industries. "They [Honda and Toyota] want suppliers to make enough money to stay in business, grow, and bring them innovation." The Big Three's supply chain model is not much different from the one set by Henry Ford. In 1913, he set up the system of independent supplier firms operating at arm's length on short-term contracts. One consequence of the Big Three's low-price-at-all-costs mentality is that suppliers are reluctant to offer them their cutting-edge technology out of fear the contract will be resourced before the research and development costs are recouped.

**Source:** Robert Sherefkin and Amy Wilson, "Suppliers Prefer Japanese Business Model," *Rubber & Plastics News*, March 17, 2003, Vol. 24, No. 11.

- a. Contrast the Japanese supply chain model with that of the Big Three.
- b. Why might a supplier prefer the Japanese model?
- c. What benefits might accrue to the Big Three by adopting the Japanese supply chain practices?



#### **EX 27-10** Employee involvement

OBJ. 1

Quickie Designs Inc. uses teams in the manufacture of lightweight wheelchairs. Two features of its team approach are team hiring and peer reviews. Under team hiring, the team recruits, interviews, and hires new team members from within the organization. Using peer reviews, the team evaluates each member of the team with regard to quality, knowledge, teamwork, goal performance, attendance, and safety. These reviews provide feedback to the team member for improvement.

How do these two team approaches differ from using managers to hire and evaluate employees?

#### **EX 27-11** Lead time reduction for a service company

OBJ. 1

Shield Insurance Company takes ten days to make payments on insurance claims. Claims are processed through three departments: Data Input, Claims Audit, and Claims Adjustment. The three departments are on different floors, approximately one hour apart from each other. Claims are processed in batches of 100. Each batch of 100 claims moves through the three departments on a wheeled cart. Management is concerned about customer dissatisfaction caused by the long lead time for claim payments.

How might this process be changed so that the lead time could be reduced significantly?



#### EX 27-12 Lean principles for a service company

OBJ.

The management of Grill Rite Burger fast-food franchise wants to provide hamburgers quickly to customers. It has been using a process by which precooked hamburgers are prepared and placed under hot lamps. These hamburgers are then sold to customers. In this process, every customer receives the same type of hamburger and dressing (ketchup, onions, mustard). If a customer wants something different, then a "special order" must be cooked to the customer's requirements. This requires the customer to wait several minutes, which often slows down the service line. Grill Rite has been receiving more and more special orders from customers, which has been slowing service down considerably.

- a. Is the Grill Rite service delivery system best described as a push or pull system? Explain.
- b. How might you use lean principles to provide customers quick service, yet still allow them to custom order their burgers?

#### EX 27-13 Accounting issues in a lean environment

OBJ. 2

Pinnacle Technologies has recently implemented a lean manufacturing approach. A production manager has approached the controller with the following comments:

I am very upset with our accounting system now that we have implemented our new lean manufacturing methods. It seems as if all I'm doing is paperwork. Our product is moving so fast through the manufacturing process that the paperwork can hardly keep up. For example, it just doesn't make sense to me to fill out daily labor reports. The employees are assigned to complete cells, performing many different tasks. I can't keep up with direct labor reports on each individual task. I thought we were trying to eliminate waste. Yet the information requirements of the accounting system are slowing us down and adding to overall lead time. Moreover, I'm still getting my monthly variance reports. I don't think that these are necessary. I have nonfinancial performance measures that are more timely than these reports. Besides, the employees don't really understand accounting variances. How about giving some information that I can really use?

What accounting system changes would you suggest in light of the production department manager's criticisms?

#### EX 27-14 Lean accounting

OBJ. 2

**✓** b. \$31.50



Right Now Video Inc. uses a lean manufacturing strategy to manufacture DVR (digital video recorder) players. The company manufactures DVR players through a single product cell. The budgeted conversion cost for the year is \$420,000 for 2,000 production hours. Each unit requires 9 minutes of cell process time. During July, 1,100 DVR players are manufactured in the cell. The materials cost per unit is \$135. The following summary transactions took place during July:

- 1. Materials are purchased for July production.
- 2. Conversion costs were applied to production.
- 3. 1,100 DVR players are assembled and placed in finished goods.
- 4. 1,060 DVR players are sold for \$335 per unit.
- a. Determine the budgeted cell conversion cost per hour.
- b. Determine the budgeted cell conversion cost per unit.
- c. Journalize the summary transactions (1)-(4) for July.

#### EX 27-15 Lean accounting

OBJ. 2

Ever-Brite Lighting Inc. manufactures lighting fixtures, using lean manufacturing methods. Style BB-01 has a materials cost per unit of \$45. The budgeted conversion cost for the year is \$193,200 for 2,100 production hours. A unit of Style BB-01 requires 15 minutes of cell production time. The following transactions took place during December:

- 1. Materials were acquired to assemble 700 Style BB-01 units for December.
- 2. Conversion costs were applied to 700 Style BB-01 units of production.
- 3. 685 units of Style BB-01 were completed in December.
- 4. 670 units of Style BB-01 were sold in December for \$128 per unit.
- a. Determine the budgeted cell conversion cost per hour.
- b. Determine the budgeted cell conversion cost per unit.
- c. Journalize the summary transactions (1)-(4) for December.

#### EX 27-16 Lean accounting

OBJ. 2

Audio Escape Inc. manufactures audio speakers. Each speaker requires \$145 per unit of direct materials. The speaker manufacturing assembly cell includes the following estimated costs for the period:

Speaker assembly cell, estimated costs:

Labor	\$ 6,300
Depreciation	2,800
Supplies	2,400
Power	1,100
Total cell costs for the period	\$12,600

The operating plan calls for 180 operating hours for the period. Each speaker requires 18 minutes of cell process time. The unit selling price for each speaker is \$360. During the period, the following transactions occurred:

- 1. Purchased materials to produce 625 speaker units.
- 2. Applied conversion costs to production of 600 speaker units.
- 3. Completed and transferred 585 speaker units to finished goods.
- 4. Sold 570 speaker units.

There were no inventories at the beginning of the period.

- a. Journalize the summary transactions (1)-(4) for the period.
- b. Determine the ending balance for raw and in process inventory and finished goods inventory.

✓ a. \$92



✓ b. Finished goods, \$2,490



#### EX 27-17 Pareto chart

OBJ. 3

Silicon Solutions Inc. manufactures RAM memory chips for personal computers. An activity analysis was conducted, and the following activity costs were identified with the manufacture and sale of memory chips:

Activities	Activity Cost
Correct shipment errors	\$ 144,000
Disposing of scrap	90,000
Emergency equipment maintenance	99,000
Employee training	36,000
Final inspection	81,000
Inspecting incoming materials	54,000
Preventive equipment maintenance	27,000
Processing customer returns	90,000
Scrap reporting	36,000
Supplier development	9,000
Warranty claims	234,000
Total	\$900,000

Prepare a Pareto chart of these activities.

#### EX 27-18 Cost of quality report

- a. Using the information in Exercise 27-17, identify the cost of quality classification for each activity.
- b. Prepare of cost of quality report. Assume sales for the period were \$3,000,000. Round percents to one decimal place.
- Interpret the cost of quality report.

#### EX 27-19 Pareto chart for a service company

**OBJ. 1, 3** 

Digital River Inc. provides cable TV and Internet service to the local community. The activities and activity costs of Digital Light are identified as follows:

Activities	<b>Activity Cost</b>
Billing error correction	\$ 36,000
Cable signal testing	96,000
Reinstalling service (installed incorrectly the first time)	30,000
Repairing satellite equipment	36,000
Repairing underground cable connections to the customer	18,000
Replacing old technology cable with higher quality cable	168,000
Replacing old technology signal switches with higher quality switches	126,000
Responding to customer home repair requests	24,000
Training employees	66,000
Total	\$600,000

Prepare a Pareto chart of these activities.

#### EX 27-20 Cost of quality and value-added/non-value-added reports for a service company

**OBJ. 1, 3** 

- a. Using the information in Exercise 27-19, identify the cost of quality classification for each activity and whether the activity is value-added or non value-added.
- b. Prepare a cost of quality report. Assume that sales are \$2,000,000. Round percentages to one decimal place.
- c. Prepare a value-added/non-value-added analysis.
- d. Interpret the information in (b) and (c).

#### **EX 27-21** Process activity analysis

OBJ. 3

The Brite Beverage Company bottles soft drinks into aluminum cans. The manufacturing process consists of three activities:

✓ a. Appraisal, 15% of total quality cost







a. External failure, 18% of total cost







✓ a. \$0.08 per can

- 1. Mixing: water, sugar, and beverage concentrate are mixed.
- 2. Filling: mixed beverage is filled into 12-oz. cans.
- 3. Packaging: properly filled cans are boxed into cardboard "fridge packs."

The activity costs associated with these activities for the period are as follows:

Mixing	\$216,000
Filling	168,000
Packaging	96,000
Total	\$480,000

The activity costs do not include materials costs, which are ignored for this analysis. Each can is expected to contain 12 ounces of beverage. Thus, after being filled, each can is automatically weighed. If a can is too light, it is rejected, or "kicked," from the filling line prior to being packaged. The primary cause of kicks is heat expansion. With heat expansion, the beverage overflows during filling, resulting in underweight cans.

This process begins by mixing and filling 6,300,000 cans during the period, of which only 6,000,000 cans are actually packaged. Three hundred thousand cans are rejected due to underweight kicks.

A process improvement team has determined that cooling the cans prior to filling them will reduce the amount of overflows due to expansion. After this improvement, the number of kicks is expected to decline from 300,000 cans to 63,000 cans, thus increasing the number of filled cans to 6,237,000 [6,000,000 + (300,000 - 63,000)].

- a. Determine the total activity cost per packaged can under present operations.
- b. Determine the amount of increased packaging activity costs from the expected improvements.
- c. Determine the expected total activity cost per packaged can after improvements. Round to two decimal places.

#### EX 27-22 Process activity analysis for a service company

OBJ. 1, 3

Continental Insurance Company has a process for making payments on insurance claims as follows:



An activity analysis revealed that the cost of these activities was as follows:

Receiving claim	\$ 80,000
Adjusting claim	240,000
Paying claim	80,000
Total	\$400,000

This process includes only the cost of processing the claim payments, not the actual amount of the claim payments. The adjusting activity involves verifying and estimating the amount of the claim and is variable to the number of claims adjusted.

The process received, adjusted, and paid 4,000 claims during the period. All claims were treated identically in this process.

To improve the cost of this process, management has determined that claims should be segregated into two categories. Claims under \$1,000 and claims greater than \$1,000: claims under \$1,000 would not be adjusted but would be accepted upon the insured's evidence of claim. Claims above \$1,000 would be adjusted. It is estimated that 70% of the claims are under \$1,000 and would thus be paid without adjustment. It is also estimated that the additional effort to segregate claims would add 15% to the "receiving claim" activity cost.

- a. Develop a table showing the percent of individual activity cost to the total process cost.
- Determine the average total process cost per claim payment, assuming 4,000 total claims.

(Continued)

✓ b. \$100 per claim payment







- c. Prepare a table showing the changes in the activity costs as a result of the changes proposed by management. Show columns of activity cost prior to improvement, after improvement, and savings.
- d. Estimate the average cost per claim payment, assuming that the changes proposed by management are enacted for 4,000 total claims.

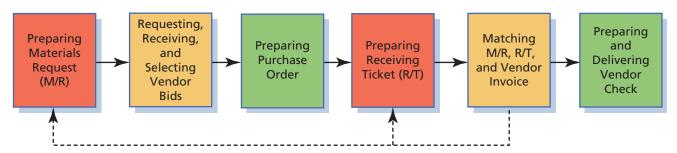
#### EX 27-23 Process activity analysis

OBJ. 1, 3

✓ b. \$20 per payment



The procurement process for Omni Wholesale Company includes a series of activities that transforms a materials requisition into a vendor check. The process begins with a request for materials. The requesting department prepares and sends a materials request form to the Purchasing Department. The Purchasing Department then places a request for a quote to vendors. Vendors prepare bids in response to the request for a quote. A vendor is selected based on the lowest bid. A purchase order to the low-bid vendor is prepared. The vendor delivers the materials to the company, whereupon a receiving ticket is prepared. Payment to the vendor is authorized if the materials request form, receiving ticket, and vendor invoice are in agreement. These three documents fail to agree 40% of the time, initiating effort to reconcile the differences. Once the three documents agree, a check is issued. The process can be diagrammed as follows:



**Correcting Reconciliation Differences** 

An activity analysis indicated the following activity costs with this process:

Preparing materials request	\$ 36,000
Requesting, receiving, and selecting vendor bids	100,000
Preparing purchase order	20,000
Preparing receiving ticket	24,000
Matching M/R, R/T, and invoice	48,000
Correcting reconciliation differences	140,000
Preparing and delivering vendor payment	32,000
Total process activity cost	\$400,000

On average, the process handles 20,000 individual requests for materials that result in 20,000 individual payments to vendors.

Management proposes to improve this process in two ways. First, the Purchasing Department will develop a preapproved vendor list for which orders can be placed without a request for quote. It is expected that this will reduce the cost of requesting and receiving vendor bids by 75%. Second, additional training and standardization will be provided to reduce errors introduced into the materials requisition form and receiving tickets. It is expected that this will reduce the number of reconciliation differences from 40% to 10%, over an average of 20,000 payments.

- a. Develop a table showing the percent of individual activity cost to the total process cost.
- b. Determine the average total process cost per vendor payment, assuming 20,000 payments.
- c. Prepare a table showing the improvements in the activity costs as a result of the changes proposed by management. Show columns of activity cost prior to improvement, after improvement, and savings.
- d. Estimate the average cost per vendor payment, assuming that the changes proposed by management are enacted for 20,000 total payments. Round to the nearest cent.

## **Problems Series A**

#### PR 27-1A Lean principles

OBJ. 1

Soft Glow, Inc. manufactures light bulbs. Their purchasing policy requires that the purchasing agents place each quarter's purchasing requirements out for bid. This is because the Purchasing Department is evaluated solely by its ability to get the lowest purchase prices. The lowest bidder receives the order for the next quarter (90 working days).

To make its bulb products, Soft Glow requires 45,000 pounds of glass per quarter. Soft Glow received two glass bids for the third quarter, as follows:

- Mid-States Glass Company: \$28.00 per pound of glass. Delivery schedule: 45,000 (500 lbs. × 90 days) pounds at the beginning of July to last for 3 months.
- Cleveland Glass Company: \$28.20 per pound of glass. Delivery schedule: 500 pounds per working day (90 days in the quarter).-

Soft Glow accepted Mid-States Glass Company's bid because it was the low-cost bid.

#### **Instructions**

- 1. Comment on Soft Glow's purchasing policy.
- 2. What are the additional (hidden) costs, beyond price, of Mid-States Glass Company's bid? Why weren't these costs considered?
- 3. Considering just inventory financing costs, what is the additional cost per pound of Mid-States Glass Company's bid if the annual cost of money is 10%? (Hint: Determine the average value of glass inventory held for the quarter and multiply by the quarterly interest charge, then divide by the number of pounds.)

PR 27-2A Lead time OBJ. 1

Sound Tek Inc. manufactures electronic stereo equipment. The manufacturing process includes printed circuit (PC) board assembly, final assembly, testing, and shipping. In the PC board assembly operation, a number of individuals are responsible for assembling electronic components into printed circuit boards. Each operator is responsible for soldering components according to a given set of instructions. Operators work on batches of 45 printed circuit boards. Each board requires 5 minutes of board assembly time. After each batch is completed, the operator moves the assembled boards to the final assembly area. This move takes 10 minutes to complete.

The final assembly for each stereo unit requires 15 minutes and is also done in batches of 45 units. A batch of 45 stereos is moved into the test building, which is across the street. The move takes 20 minutes. Before conducting the test, the test equipment must be set up for the particular stereo model. The test setup requires 25 minutes. The units wait while the setup is performed. In the final test, the 45-unit batch is tested one at a time. Each test requires 9 minutes. The completed batch, after all testing, is sent to shipping for packaging and final shipment to customers. A complete batch of 45 units is sent from testing to shipping. The Shipping Department is located next to testing. Thus, there is no move time between these two operations. Packaging and labeling requires 10 minutes per unit.

#### **Instructions**

- 1. Determine the amount of value-added and non-value-added lead time and the valueadded ratio in this process for an average stereo unit in a batch of 45 units. Round percentages to one decimal place. Categorize the non-value-added time into wait and
- 2. How could this process be improved so as to reduce the amount of waste in the process?

✓ 1. Total wait time, 1,741 minutes



✓ 4. Raw and In Process Inventory, \$74,250





#### PR 27-3A Lean accounting

OBJ. 2

Formula One Displays Inc. manufactures and assembles automobile instrument panels for both Yokohama Motors and Detroit Motors. The process consists of a lean product cell for each customer's instrument assembly. The data that follow concern only the Yokohama lean cell.

(Continued)

For the year, Grand Prix Displays Inc. budgeted the following costs for the Yokohama production cell:

Conversion Cost Categories	Budget
Labor	\$585,000
Supplies	45,000
Utilities	30,000
Total	\$660,000

Grand Prix Displays Inc. plans 2,200 hours of production for the Yokohama cell for the year. The materials cost is \$180 per instrument assembly. Each assembly requires 15 minutes of cell assembly time. There was no November 1 inventory for either Raw and In Process Inventory or Finished Goods Inventory.

The following summary events took place in the Yokohama cell during November:

- a. Electronic parts and wiring were purchased to produce 9,000 instrument assemblies in November.
- b. Conversion costs were applied for the production of 8,800 units in November.
- c. 8,650 units were started, completed, and transferred to finished goods in November.
- d. 8,600 units were shipped to customers at a price of \$400 per unit.

#### Instructions

- 1. Determine the budgeted cell conversion cost per hour.
- 2. Determine the budgeted cell conversion cost per unit.
- 3. Journalize the summary transactions (a) through (d).
- Determine the ending balance in Raw and In Process Inventory and Finished Goods Inventory.
- 5. How does the accounting in a lean environment differ from traditional accounting?

#### PR 27-4A Pareto chart and cost of quality report for a service company

The administrator of Hope Hospital has been asked to perform an activity analysis of the emergency room (ER). The ER activities include cost of quality and other patient care activities. The lab tests and transportation are hospital services external to the ER for determining external failure costs. The result of the activity analysis is summarized as follows:

Activities	Activity Cost
Patient registration	\$ 6,400
Verifying patient information	9,600
Assigning patients	12,800
Searching/waiting for doctor	8,000
Doctor exam	4,800
Waiting for transport	17,600
Transporting patients	16,000
Verifying lab orders	14,400
Searching for equipment	8,000
Incorrect labs	12,800
Lab tests	17,600
Counting supplies	19,200
Looking for supplies	8,000
Staff training	4,800
Total	\$160,000

#### **Instructions**

- 1. Prepare a Pareto chart of the ER activities.
- Classify the activities into prevention, appraisal, internal failure, external failure, and other patient care activities. Classify the activities into value-added and non-value added activities.
- 3. Use the activity cost information to determine the percentages of total ER costs that are prevention, appraisal, internal failure, external failure, and other patient care activities.
- 4. Determine the percentages of the total ER costs that are value- and non-value-added.
- 5. Interpret the information.

✓ 3. Non-valueadded, 61%





## **Problems Series B**

#### PR 27-1B Lean principles

OBJ. 1

HD Hogg Motorcycle Company manufactures a variety of motorcycles. Hogg's purchasing policy requires that the purchasing agents place each quarter's purchasing requirements out for bid. This is because the Purchasing Department is evaluated solely by its ability to get the lowest purchase prices. The lowest cost bidder receives the order for the next quarter (90 days). To make its motorcycles, Hogg requires 4,500 frames per quarter. Hogg received two frame bids for the third quarter, as follows:

- Famous Frames, Inc.: \$301 per frame. Delivery schedule: 50 frames per working day (90 days in the quarter).
- *Iron Horse Frames Inc.*: \$300 per frame. Delivery schedule: 4,500 (50 frames × 90 days) frames at the beginning of July to last for three months.

Hogg accepted Iron Horse Frames Inc.'s bid because it was the low-cost bid.

#### **Instructions**

- 1. Comment on Hogg's purchasing policy.
- 2. What are the additional (hidden) costs, beyond price, of Iron Horse Frames Inc.'s bid? Why weren't these costs considered?
- 3. Considering just inventory financing costs, what is the additional cost per frame of Iron Horse Frames Inc.'s bid if the annual cost of money is 12%? (*Hint:* Determine the average value of frame inventory held for the quarter and multiply by the quarterly interest charge, then divide by the number of frames.)

PR 27-2B Lead time OBJ. 1

✓ 1. Total wait time, 2,010 minutes



Master Chef Appliance Company manufactures home kitchen appliances. The manufacturing process includes stamping, final assembly, testing, and shipping. In the stamping operation, a number of individuals are responsible for stamping the steel outer surface of the appliance. The stamping operation is set up prior to each run. A run of 40 stampings is completed after each setup. A setup requires 60 minutes. The parts wait for the setup to be completed before stamping begins. Each stamping requires 5 minutes of operating time. After each batch is completed, the operator moves the stamped covers to the final assembly area. This move takes 10 minutes to complete.

The final assembly for each appliance unit requires 22 minutes and is also done in batches of 40 appliance units. The batch of 40 appliance units is moved into the test building, which is across the street. The move takes 25 minutes. In the final test, the 40-unit batch is tested one at a time. Each test requires 8 minutes. The completed units are sent to shipping for packaging and final shipment to customers. A complete batch of 40 units is sent from testing to shipping. The Shipping Department is located next to testing. Thus, there is no move time between these two operations. Packaging and shipment labeling requires 15 minutes per unit.

#### **Instructions**

- 1. Determine the amount of value-added and non-value-added lead time and the value-added ratio in this process for an average kitchen appliance in a batch of 40 units. Round percentages to one decimal place. Categorize the non-value-added time into wait and move time.
- 2. How could this process be improved so as to reduce the amount of waste in the process?

✓ 4. Raw and In Process Inventory, \$97,900





#### PR 27-3B Lean accounting

OBJ. 2

Com-Tel Inc. manufactures and assembles two models of smart phones—the Tiger Model and the Lion Model. The process consists of a lean cell for each product. The data that follow concern only the Lion Model lean cell.

(Continued)

For the year, Com-Tel Inc. budgeted these costs for the Lion Model production cell:

<b>Conversion Cost Categories</b>	Budget
Labor	\$122,000
Supplies	49,000
Utilities	18,000
Total	\$189,000

Com-Tel plans 2,100 hours of production for the Lion Model cell for the year. The materials cost is \$185 per unit. Each assembly requires 12 minutes of cell assembly time. There was no May 1 inventory for either Raw and In Process Inventory or Finished Goods Inventory.

The following summary events took place in the Lion Model cell during May:

- a. Electronic parts were purchased to produce 10,700 Lion Model assemblies in May.
- b. Conversion costs were applied for 10,500 units of production in May.
- c. 10,200 units were completed and transferred to finished goods in May.
- d. 10,000 units were shipped to customers at a price of \$500 per unit.

#### **Instructions**

- 1. Determine the budgeted cell conversion cost per hour.
- 2. Determine the budgeted cell conversion cost per unit.
- 3. Journalize the summary transactions (a) through (d).
- 4. Determine the ending balance in Raw and In Process Inventory and Finished Goods Inventory.
- 5. How does the accounting in a lean environment differ from traditional accounting?

#### PR 27-4B Pareto chart and cost of quality report for a manufacturing company OBJ

The president of Mission Inc. has been concerned about the growth in costs over the last several years. The president asked the controller to perform an activity analysis to gain a better insight into these costs. The activity analysis revealed the following:

Activities	Activity Cost
Correcting invoice errors	\$ 7,500
Disposing of incoming materials with poor quality	15,000
Disposing of scrap	27,500
Expediting late production	22,500
Final inspection	20,000
Inspecting incoming materials	5,000
Inspecting work in process	25,000
Preventive machine maintenance	15,000
Producing product	97,500
Responding to customer quality complaints	15,000
Total	\$250,000

The production process is complicated by quality problems, requiring the production manager to expedite production and dispose of scrap.

#### Instructions

- 1. Prepare a Pareto chart of the company activities.
- Classify the activities into prevention, appraisal, internal failure, external failure, and not costs of quality (producing product). Classify the activities into value-added and non-value added activities.
- 3. Use the activity cost information to determine the percentages of total costs that are prevention, appraisal, internal failure, external failure, and not costs of quality.
- 4. Determine the percentages of total costs that are value- and non-value-added.
- 5. Interpret the information.

✓ 3. Non-valueadded, 35%

## **Cases & Projects**



#### CP 27-1 Ethics and professional conduct in business

In August, Lannister Company introduced a new performance measurement system in manufacturing operations. One of the new performance measures was lead time. The lead time was determined by tagging a random sample of items with a log sheet throughout the month. This log sheet recorded the time that the item started and the time that it ended production, as well as all steps in between. The controller collected the log sheets and calculated the average lead time of the tagged products. This number was reported to central management and was used to evaluate the performance of the plant manager. The plant was under extreme pressure to reduce lead time because of poor lead time results reported in September.

The following memo was intercepted by the controller.

Date: October 1

To: Hourly Employees From: Plant Manager

During last month, you noticed that some of the products were tagged with a log sheet. This sheet records the time that a product enters production and the time that it leaves production. The difference between these two times is termed the "lead time." Our plant is evaluated on improving lead time. From now on, I ask all of you to keep an eye out for the tagged items. When you receive a tagged item, it is to receive special attention. Work on that item first, and then immediately move it to the next operation. Under no circumstances should tagged items wait on any other work that you have. Naturally, report accurate information. I insist that you record the correct times on the log sheet as the product goes through your operations.



How should the controller respond to this discovery?

#### CP 27-2 Lean principles

Reliant Products Inc. manufactures electric space heaters. While the CEO, Lynn Jennings, is visiting the production facility, the following conversation takes place with the plant manager, Aaron Clark:

Lynn: As I walk around the facility, I can't help noticing all the materials inventories. What's going on?

Aaron: I have found our suppliers to be very unreliable in meeting their delivery commitments. Thus, I keep a lot of materials on hand so as to not risk running out and shutting down production.

Lynn: Not only do I see a lot of materials inventory, but there also seems to be a lot of finished goods inventory on hand. Why is this?

Aaron: As you know, I am evaluated on maintaining a low cost per unit. The one way that I am able to reduce my unit costs is by producing as many space heaters as possible. This allows me to spread my fixed costs over a larger base. When orders are down, the excess production builds up as inventory, as we are seeing now. But don't worry—I'm really keeping our unit costs down this way.

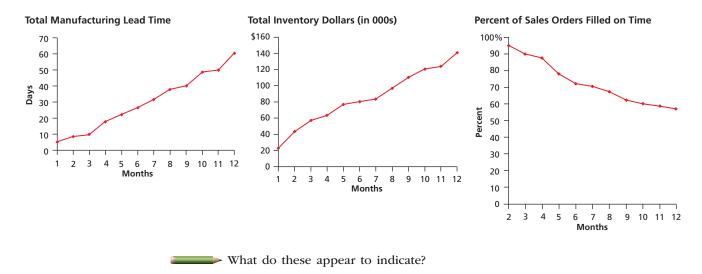
Lynn: I'm not so sure. It seems that this inventory must cost us something.

Aaron: Not really. I'll eventually use the materials and we'll eventually sell the finished goods. By keeping the plant busy, I'm using our plant assets wisely. This is reflected in the low unit costs that I'm able to maintain.

If you were Lynn Jennings, how would you respond to Aaron Clark? What recommendations would you provide Aaron Clark?

#### CP 27-3 Lean principles

Maxxim Inc. prepared the following performance graphs for the prior year:



#### CP 27-4 Value-added and non-value-added activity costs

Pryor Company prepared the following factory overhead report from its general ledger:

Indirect labor	\$250,000
Fringe benefits	30,000
Supplies	70,000
Depreciation	50,000
Total	\$400,000

The management of Pryor Company was dissatisfied with this report and asked the controller to prepare an activity analysis of the same information. This activity analysis was as follows:

Processing sales orders	\$ 68,000	17%
Disposing of scrap	96,000	24
Expediting work orders	80,000	20
Producing parts	44,000	11
Resolving supplier quality problems	56,000	14
Reissuing corrected purchase orders	40,000	10
Expediting customer orders	16,000	4
Total	\$400,000	100%

Interpret the activity analysis by identifying value-added and non-value-added activity costs. How does the activity cost report differ from the general ledger report?

#### CP 27-5 Lead time

#### **Group Project**

In groups of two to four people, visit a sit-down restaurant and do a lead time study. If more than one group chooses to visit the same restaurant, choose different times for your visits. Note the time when you walk in the door of the restaurant and the time when you walk out the door after you have eaten. The difference between these two times is the total lead time of your restaurant experience. While in the restaurant, determine the time spent on non-value-added time, such as wait time, and the time spent on value-added eating time. Note the various activities and the time required to perform each activity during your visit to the restaurant. Compare your analyses, identifying possible reasons for differences in the times recorded by groups that visited the same restaurant.

# Appendices

- A Interest Tables
- B Nike Inc., Form 10-K For the Fiscal Year Ended May 31, 2013
- International Financial Reporting Standards (IFRS)
- Revenue Recognition

The following appendices are available online at www.cengagebrain.com:

- Reversing Entries
- F Special Journals and Subsidiary Ledgers

# Appendix A

## **Interest Tables**

Periods	4.0%	4.5%	5%	5.5%	6%	6.5%	7%
1	0.96154	0.95694	0.95238	0.94787	0.94340	0.93897	0.93458
2	0.92456	0.91573	0.90703	0.89845	0.89000	0.88166	0.8734
3	0.88900	0.87630	0.86384	0.85161	0.83962	0.82785	0.8163
4	0.85480	0.83856	0.82270	0.80722	0.79209	0.77732	0.7629
5	0.82193	0.80245	0.78353	0.76513	0.74726	0.72988	0.7129
6	0.79031	0.76790	0.74622	0.72525	0.70496	0.68533	0.6663
7	0.75992	0.73483	0.71068	0.68744	0.66506	0.64351	0.6227
8	0.73069	0.70319	0.67684	0.65160	0.62741	0.60423	0.5820
9	0.70259	0.67290	0.64461	0.61763	0.59190	0.56735	0.5439
10	0.67556	0.64393	0.61391	0.58543	0.55839	0.53273	0.5083
11	0.64958	0.61620	0.58468	0.55491	0.52679	0.50021	0.4750
12	0.62460	0.58966	0.55684	0.52598	0.49697	0.46968	0.4440
13	0.60057	0.56427	0.53032	0.49856	0.46884	0.44102	0.4149
14	0.57748	0.53997	0.50507	0.47257	0.44230	0.41410	0.3878
15	0.55526	0.51672	0.48102	0.44793	0.41727	0.38883	0.3624
16	0.53391	0.49447	0.45811	0.42458	0.39365	0.36510	0.3387
17	0.51337	0.47318	0.43630	0.40245	0.37136	0.34281	0.3165
18	0.49363	0.45280	0.41552	0.38147	0.35034	0.32189	0.2958
19	0.47464	0.43330	0.39573	0.36158	0.33051	0.30224	0.2765
20	0.45639	0.41464	0.37689	0.34273	0.31180	0.28380	0.2584
21	0.43883	0.39679	0.35894	0.32486	0.29416	0.26648	0.2415
22	0.42196	0.37970	0.34185	0.30793	0.27751	0.25021	0.2257
23	0.40573	0.36335	0.32557	0.29187	0.26180	0.23494	0.2109
24	0.39012	0.34770	0.31007	0.27666	0.24698	0.22060	0.1971
25	0.37512	0.33273	0.29530	0.26223	0.23300	0.20714	0.1842
26	0.36069	0.31840	0.28124	0.24856	0.21981	0.19450	0.1722
27	0.34682	0.30469	0.26785	0.23560	0.20737	0.18263	0.1609
28	0.33348	0.29157	0.25509	0.22332	0.19563	0.17148	0.1504
29	0.32065	0.27902	0.24295	0.21168	0.18456	0.16101	0.1405
30	0.30832	0.26700	0.23138	0.20064	0.17411	0.15119	0.1313
31	0.29646	0.25550	0.22036	0.19018	0.16425	0.14196	0.1227
32	0.28506	0.24450	0.20987	0.18027	0.15496	0.13329	0.1147
33	0.27409	0.23397	0.19987	0.17087	0.14619	0.12516	0.1072
34	0.26355	0.22390	0.19035	0.16196	0.13791	0.11752	0.1002
35	0.25342	0.21425	0.18129	0.15352	0.13011	0.11035	0.0936
40	0.20829	0.17193	0.14205	0.11746	0.09722	0.08054	0.0667
45	0.17120	0.13796	0.11130	0.08988	0.07265	0.05879	0.0476
50	0.14071	0.11071	0.08720	0.06877	0.05429	0.04291	0.0339

Periods	8%	9%	10%	11%	12%	13%	14%
1	0.92593	0.91743	0.90909	0.90090	0.89286	0.88496	0.87719
2	0.85734	0.84168	0.82645	0.81162	0.79719	0.78315	0.76947
3	0.79383	0.77218	0.75131	0.73119	0.71178	0.69305	0.67497
4	0.73503	0.70843	0.68301	0.65873	0.63552	0.61332	0.59208
5	0.68058	0.64993	0.62092	0.59345	0.56743	0.54276	0.51937
6	0.63017	0.59627	0.56447	0.53464	0.50663	0.48032	0.45559
7	0.58349	0.54703	0.51316	0.48166	0.45235	0.42506	0.39964
8	0.54027	0.50187	0.46651	0.43393	0.40388	0.37616	0.35056
9	0.50025	0.46043	0.42410	0.39092	0.36061	0.33288	0.3075
10	0.46319	0.42241	0.38554	0.35218	0.32197	0.29459	0.26974
11	0.42888	0.38753	0.35049	0.31728	0.28748	0.26070	0.2366
12	0.39711	0.35553	0.31863	0.28584	0.25668	0.23071	0.20756
13	0.36770	0.32618	0.28966	0.25751	0.22917	0.20416	0.1820
14	0.34046	0.29925	0.26333	0.23199	0.20462	0.18068	0.1597
15	0.31524	0.27454	0.23939	0.20900	0.18270	0.15989	0.1401
16	0.29189	0.25187	0.21763	0.18829	0.16312	0.14150	0.1228
17	0.27027	0.23107	0.19784	0.16963	0.14564	0.12522	0.1078
18	0.25025	0.21199	0.17986	0.15282	0.13004	0.11081	0.0945
19	0.23171	0.19449	0.16351	0.13768	0.11611	0.09806	0.0829
20	0.21455	0.17843	0.14864	0.12403	0.10367	0.08678	0.0727
21	0.19866	0.16370	0.13513	0.11174	0.09256	0.07680	0.06383
22	0.18394	0.15018	0.12285	0.10067	0.08264	0.06796	0.05599
23	0.17032	0.13778	0.11168	0.09069	0.07379	0.06014	0.0491
24	0.15770	0.12640	0.10153	0.08170	0.06588	0.05323	0.0430
25	0.14602	0.11597	0.09230	0.07361	0.05882	0.04710	0.0377
26	0.13520	0.10639	0.08391	0.06631	0.05252	0.04168	0.0331
27	0.12519	0.09761	0.07628	0.05974	0.04689	0.03689	0.0290
28	0.12513	0.08955	0.06934	0.05374	0.04187	0.03264	0.0255
29	0.11331	0.08215	0.06304	0.04849	0.03738	0.03204	0.0233
30	0.09938	0.07537	0.05731	0.04368	0.03338	0.02557	0.0196
31	0.09202	0.06915	0.05210	0.03935	0.02980	0.02262	0.0172
32	0.08520	0.06344	0.04736	0.03545	0.02661	0.02202	0.0172
33	0.00320	0.05820	0.04306	0.03343	0.02376	0.02002	0.0131
34	0.07305	0.05339	0.03914	0.02878	0.02121	0.01772	0.0132
35	0.06763	0.04899	0.03558	0.02592	0.01894	0.01388	0.0101
40	0.04603	0.03184	0.02209	0.01538	0.01075	0.00753	0.00529
45	0.03133	0.02069	0.01372	0.00913	0.00610	0.00409	0.00275
50	0.02132	0.01345	0.00852	0.00542	0.00346	0.00222	0.00143

#### A-4 Appendix A Interest Tables

Periods	4.0%	4.5%	5%	5.5%	6%	6.5%	7%
1	0.96154	0.95694	0.95238	0.94787	0.94340	0.93897	0.93458
2	1.88609	1.87267	1.85941	1.84632	1.83339	1.82063	1.80802
3	2.77509	2.74896	2.72325	2.69793	2.67301	2.64848	2.62432
4	3.62990	3.58753	3.54595	3.50515	3.46511	3.42580	3.3872
5	4.45182	4.38998	4.32948	4.27028	4.21236	4.15568	4.10020
6	5.24214	5.15787	5.07569	4.99553	4.91732	4.84101	4.76654
7	6.00205	5.89270	5.78637	5.68297	5.58238	5.48452	5.38929
8	6.73274	6.59589	6.46321	6.33457	6.20979	6.08875	5.97130
9	7.43533	7.26879	7.10782	6.95220	6.80169	6.65610	6.51523
10	8.11090	7.91272	7.72173	7.53763	7.36009	7.18883	7.02358
11	8.76048	8.52892	8.30641	8.09254	7.88687	7.68904	7.4986
12	9.38507	9.11858	8.86325	8.61852	8.38384	8.15873	7.94269
13	9.98565	9.68285	9.39357	9.11708	8.85268	8.59974	8.3576
14	10.56312	10.22283	9.89864	9.58965	9.29498	9.01384	8.7454
15	11.11839	10.73955	10.37966	10.03758	9.71225	9.40267	9.1079
16	11.65230	11.23402	10.83777	10.46216	10.10590	9.76776	9.4466
17	12.16567	11.70719	11.27407	10.86461	10.47726	10.11058	9.7632
18	12.65930	12.15999	11.68959	11.24607	10.82760	10.43247	10.05909
19	13.13394	12.59329	12.08532	11.60765	11.15812	10.73471	10.33560
20	13.59033	13.00794	12.46221	11.95038	11.46992	11.01851	10.5940
21	14.02916	13.40472	12.82115	12.27524	11.76408	11.28498	10.8355
22	14.45112	13.78442	13.16300	12.58317	12.04158	11.53520	11.0612
23	14.85684	14.14777	13.48857	12.87504	12.30338	11.77014	11.27219
24	15.24696	14.49548	13.79864	13.15170	12.55036	11.99074	11.46933
25	15.62208	14.82821	14.09394	13.41393	12.78336	12.19788	11.65358
0.0	45.00077	45.44004	1107510	40.00050	10.00017	10.00007	44.0057
26	15.98277	15.14661	14.37519	13.66250	13.00317	12.39237	11.82578
27	16.32959	15.45130	14.64303	13.89810	13.21053	12.57500	11.9867
28	16.66306	15.74287	14.89813	14.12142	13.40616	12.74648	12.1371
29	16.98371	16.02189	15.14107	14.33310	13.59072	12.90749	12.2776
30	17.29203	16.28889	15.37245	14.53375	13.76483	13.05868	12.40904
31	17.58849	16.54439	15.59281	14.72393	13.92909	13.20063	12.5318
32	17.87355	16.78889	15.80268	14.90420	14.08404	13.33393	12.64656
33	18.14765	17.02286	16.00255	15.07507	14.23023	13.45909	12.75379
34	18.41120	17.24676	16.19290	15.23703	14.36814	13.57661	12.8540
35	18.66461	17.46101	16.37419	15.39055	14.49825	13.68696	12.9476
40	19.79277	18.40158	17.15909	16.04612	15.04630	14.14553	13.3317
45	20.72004	19.15635	17.77407	16.54773	15.45583	14.48023	13.60552
50	21.48218	19.76201	18.25593	16.93152	15.76186	14.72452	13.8007!

Periods	8%	9%	10%	11%	12%	13%	14%
1	0.92593	0.91743	0.90909	0.90090	0.89286	0.88496	0.87719
2	1.78326	1.75911	1.73554	1.71252	1.69005	1.66810	1.64666
3	2.57710	2.53129	2.48685	2.44371	2.40183	2.36115	2.32163
4	3.31213	3.23972	3.16987	3.10245	3.03735	2.97447	2.91371
5	3.99271	3.88965	3.79079	3.69590	3.60478	3.51723	3.43308
6	4.62288	4.48592	4.35526	4.23054	4.11141	3.99755	3.88867
7	5.20637	5.03295	4.86842	4.71220	4.56376	4.42261	4.28830
8	5.74664	5.53482	5.33493	5.14612	4.96764	4.79677	4.63886
9	6.24689	5.99525	5.75902	5.53705	5.32825	5.13166	4.94637
10	6.71008	6.41766	6.14457	5.88923	5.65022	5.42624	5.21612
11	7.13896	6.80519	6.49506	6.20652	5.93770	5.68694	5.45273
12	7.53608	7.16073	6.81369	6.49236	6.19437	5.91765	5.66029
13	7.90378	7.48690	7.10336	6.74987	6.42355	6.12181	5.84236
14	8.22424	7.78615	7.36669	6.96187	6.62817	6.30249	6.00207
15	8.55948	8.06069	7.60608	7.19087	6.81086	6.46238	6.14217
16	8.85137	8.31256	7.82371	7.37916	6.97399	6.60388	6.26506
17	9.12164	8.54363	8.02155	7.54879	7.11963	6.72909	6.37286
18	9.37189	8.75563	8.20141	7.70162	7.24967	6.83991	6.46742
19	9.60360	8.95011	8.36492	7.83929	7.36578	6.93797	6.55037
20	9.81815	9.12855	8.51356	7.96333	7.46944	7.02475	6.62313
21	10.01680	9.29224	8.64869	8.07507	7.56200	7.10155	6.68696
22	10.20074	9.44243	8.77154	8.17574	7.64465	7.16951	6.74294
23	10.37106	9.58021	8.88322	8.26643	7.71843	7.22966	6.79206
24	10.52876	9.70661	8.98474	8.34814	7.78432	7.28288	6.83514
25	10.67478	9.82258	9.07704	8.42174	7.84314	7.32998	6.87293
26	10.80998	9.92897	9.16095	8.48806	7.89566	7.37167	6.90608
27	10.93516	10.02658	9.23722	8.54780	7.94255	7.40856	6.93515
28	11.05108	10.11613	9.30657	8.60162	7.98442	7.44120	6.96066
29	11.15841	10.19828	9.36961	8.65011	8.02181	7.47009	6.98304
30	11.25778	10.27365	9.42691	8.69379	8.05518	7.49565	7.00266
31	11.34980	10.34280	9.47901	8.73315	8.08499	7.51828	7.01988
32	11.43500	10.40624	9.52638	8.76860	8.11159	7.53830	7.03498
33	11.51389	10.46444	9.56943	8.80054	8.13535	7.55602	7.04823
34	11.58693	10.51784	9.60857	8.82932	8.15656	7.57170	7.05985
35	11.65457	10.56682	9.64416	8.85524	8.17550	7.58557	7.07005
40	11.92461	10.75736	9.77905	8.95105	8.24378	7.63438	7.10504
45	12.10840	10.88120	9.86281	9.00791	8.28252	7.66086	7.12322
50	12.23348	10.96168	9.91481	9.04165	8.30450	7.67524	7.13266

# Appendix B

## Nike Inc., Form 10-K For the Fiscal Year Ended May 31, 2013

## **NIKE INC**

## FORM 10-K (Annual Report)

## Filed 07/23/13 for the Period Ending 05/31/13

Address ONE BOWERMAN DR

BEAVERTON, OR 97005-6453

Telephone 5036713173

CIK 0000320187

Symbol NKE

SIC Code 3021 - Rubber and Plastics Footwear

Industry Footwear

Sector Consumer Cyclical

Fiscal Year 05/31

### Management's Annual Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) and Rule 15d-15(f) of the Securities Exchange Act of 1934, as amended. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the financial statements for external purposes in accordance with generally accepted accounting principles in the United States of America. Internal control over financial reporting includes those policies and procedures that: (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of assets of the Company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of our management and directors; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of assets of the Company that could have a material effect on the financial statements.

While "reasonable assurance" is a high level of assurance, it does not mean absolute assurance. Because of its inherent limitations, internal control over financial reporting may not prevent or detect every misstatement and instance

of fraud. Controls are susceptible to manipulation, especially in instances of fraud caused by the collusion of two or more people, including our senior management. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, our management conducted an evaluation of the effectiveness of our internal control over financial reporting based upon the framework in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on the results of our evaluation, our management concluded that our internal control over financial reporting was effective as of May 31, 2013.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has audited (1) the consolidated financial statements and (2) the effectiveness of our internal control over financial reporting as of May 31, 2013, as stated in their report herein.

Mark G. Parker

President and Chief Executive Officer

Donald W. Blair

Chief Financial Officer

### Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of NIKE, Inc.:

In our opinion, the consolidated financial statements listed in the index appearing under Item 15(a)(1) present fairly, in all material respects, the financial position of NIKE, Inc. and its subsidiaries at May 31, 2013 and 2012, and the results of their operations and their cash flows for each of the three years in the period ended May 31, 2013 in conformity with accounting principles generally accepted in the United States of America. In addition, in our opinion, the financial statement schedule listed in the appendix appearing under Item 15(a)(2) presents fairly, in all material respects, the information set forth therein when read in conjunction with the related consolidated financial statements. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of May 31, 2013, based on criteria established in Internal Control — Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The Company's management is responsible for these financial statements and financial statement schedule, for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Annual Report on Internal Control Over Financial Reporting appearing under Item 8. Our responsibility is to express opinions on these financial statements, on the financial statement schedule, and on the Company's internal control over financial reporting based on our integrated audits. We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/S/ PRICEWATERHOUSECOOPERS LLP

Portland, Oregon July 23, 2013

## NIKE, Inc. Consolidated Statements Of Income

		Year Ended May 31,								
millions, except per share data)		2013		2012	2011					
Income from continuing operations:										
Revenues	\$	25,313	\$	23,331	\$ 20,117					
Cost of sales		14,279		13,183	10,915					
Gross profit		11,034		10,148	9,202					
Demand creation expense		2,745		2,607	2,344					
Operating overhead expense		5,035		4,458	4,017					
Total selling and administrative expense		7,780		7,065	6,361					
Interest (income) expense, net (Notes 6, 7 and 8)		(3)		4	4					
Other (income) expense, net (Note 17)		(15)		54	(25)					
Income before income taxes		3,272		3,025	2,862					
Income tax expense (Note 9)		808		756	690					
NET INCOME FROM CONTINUING OPERATIONS		2,464		2,269	2,172					
NET INCOME (LOSS) FROM DISCONTINUED OPERATIONS	21		(46)	(39)						
NET INCOME	\$	2,485	\$	2,223	\$ 2,133					
Earnings per share from continuing operations:										
Basic earnings per common share (Notes 1 and 12)	\$	2.75	\$	2.47	\$ 2.28					
Diluted earnings per common share (Notes 1 and 12)	\$	2.69	\$	2.42	\$ 2.24					
Earnings per share from discontinued operations:										
Basic earnings per common share (Notes 1 and 12)	\$	0.02	\$	(0.05)	\$ (0.04)					
Diluted earnings per common share (Notes 1 and 12)	\$	0.02	\$	(0.05)	\$ (0.04)					
Dividends declared per common share	\$	0.81	\$	0.70	\$ 0.60					

The accompanying notes to consolidated financial statements are an integral part of this statement.

## NIKE, Inc. Consolidated Statements of Comprehensive Income

	Year Ended May 31,								
(In millions)		2013	2012			2011			
Net income	\$	2,485	\$	2,223	\$	2,133			
Other comprehensive income (loss), net of tax:									
Foreign currency translation and other (1)		30		(295)		263			
Net gain (loss) on cash flow hedges (2)		117		255		(242)			
Net gain (loss) on net investment hedges (3)		_		45		(57)			
Reclassification to net income of previously deferred (gains) losses related to hedge derivative instruments ⁽⁴⁾		(105)		49		(84)			
Release of cumulative translation loss related to Umbro ⁽⁵⁾ (Notes 14 and 15)		83		_		_			
Total other comprehensive income, net of tax		125	•	54		(120)			
TOTAL COMPREHENSIVE INCOME	\$	2,610	\$	2,277	\$	2,013			

- (1) Net of tax (expense) benefit of \$(12) million, \$0 million, and \$(121) million, respectively.
- (2) Net of tax (expense) benefit of \$(22) million, \$(8) million, and \$66 million, respectively.
- (3) Net of tax benefit of \$0 million, \$0 million, and \$28 million, respectively.
- (4) Net of tax (benefit) expense of \$0 million, \$(14) million, and \$24 million, respectively.
- (5) Net of tax (benefit) of \$(47) million, \$0 million, and \$0 million, respectively.

The accompanying notes to consolidated financial statements are an integral part of this statement.

## NIKE, Inc. Consolidated Balance Sheets

	M	May 31,						
(In millions)	2013	2012						
ASSETS								
Current assets:	\$ 3,33	7						
Cash and equivalents		\$ 2,317						
Short-term investments (Note 6)	2,62	1,440						
Accounts receivable, net (Note 1)	3,11	<mark>7</mark> 3,132						
Inventories (Notes 1 and 2)	3,43	3,222						
Deferred income taxes (Note 9)	30	8 262						
Prepaid expenses and other current assets (Notes 6 and 17)	80	2 857						
Assets of discontinued operations (Note 15)	-	615						
Total current assets	13,62	<b>6</b> 11,845						
Property, plant and equipment, net (Note 3)	2,45	2,209						
Identifiable intangible assets, net (Note 4)	38	2 370						
Goodwill (Note 4)	13	1 131						
Deferred income taxes and other assets (Notes 6, 9 and 17)	99	910						
TOTALASSETS	\$ 17,58	<mark>4</mark> \$ 15,465						
LIABILITIES AND SHAREHOLDERS' EQUITY								
Current liabilities:								
Current portion of long-term debt (Note 8)	\$ 5	7 \$ 49						
Notes payable (Note 7)	12	1 108						
Accounts payable (Note 7)	1,64	6 1,549						
Accrued liabilities (Notes 5, 6 and 17)	1,98	6 1,94 ²						
Income taxes payable (Note 9)	9	8 65						
Liabilities of discontinued operations (Note 15)	1	8 170						
Total current liabilities	3,92	6 3,882						
Long-term debt (Note 8)	1,21	0 228						
Deferred income taxes and other liabilities (Notes 6, 9 and 17)	1,29	2 974						
Commitments and contingencies (Note 16)	_	_						
Redeemable Preferred Stock (Note 10)	_	_						
Shareholders' equity:								
Common stock at stated value (Note 11):								
Class A convertible — 178 and 180 shares outstanding	_	_						
Class B — 716 and 736 shares outstanding		3						
Capital in excess of stated value	5,18	4,641						
Accumulated other comprehensive income (Note 14)	27	4 149						
Retained earnings	5,69	5,588						
Total shareholders' equity	11,15							
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	\$ 17,58							

The accompanying notes to consolidated financial statements are an integral part of this statement.

## NIKE, Inc. Consolidated Statements of Cash Flows

	Year Ended May 31,							
(In millions)	2013	2012	2011					
Cash provided by operations:								
Net income	\$ 2,485	\$ 2,223	\$ 2,133					
Income charges (credits) not affecting cash:								
Depreciation	438	373	335					
Deferred income taxes	21	(60)	(76)					
Stock-based compensation (Note 11)	174	130	105					
Amortization and other	75	32	23					
Net gain on divestitures	(124)	_	_					
Changes in certain working capital components and other assets and liabilities:								
Decrease (increase) in accounts receivable	142	(323)	(273)					
(Increase) in inventories	(197)	(805)	(551)					
(Increase) in prepaid expenses and other current assets	(28)	(141)	(35)					
Increase in accounts payable, accrued liabilities and income taxes payable	41	470	151					
Cash provided by operations	3,027	1,899	1,812					
Cash (used) provided by investing activities:								
Purchases of short-term investments	(3,702)	(2,705)	(7,616)					
Maturities of short-term investments	1,501	2,585	4,313					
Sales of short-term investments	998	1,244	2,766					
Additions to property, plant and equipment	(636)	(597)	(432)					
Disposals of property, plant and equipment	14	2	1					
Proceeds from divestitures	786	_	_					
Increase in other assets, net of other liabilities	(28)	(37)	(30)					
Settlement of net investment hedges	_	22	(23)					
Cash (used) provided by investing activities	(1,067)	514	(1,021)					
Cash used by financing activities:								
Net proceeds from long-term debt issuance	986	_	_					
Long-term debt payments, including current portion	(49)	(203)	(8)					
Increase (decrease) in notes payable	15	(65)	41					
Proceeds from exercise of stock options and other stock issuances	313	468	345					
Excess tax benefits from share-based payment arrangements	72	115	64					
Repurchase of common stock	(1,674)	(1,814)	(1,859)					
Dividends — common and preferred	(703)		(555)					
Cash used by financing activities	(1,040)	(2,118)	(1,972)					
Effect of exchange rate changes	100	67	57					
Net increase (decrease) in cash and equivalents	1,020	362	(1,124)					
Cash and equivalents, beginning of year	2,317	1,955	3,079					
CASH AND EQUIVALENTS, END OF YEAR	\$ 3,337							
Supplemental disclosure of cash flow information:								
Cash paid during the year for:								
Interest, net of capitalized interest	\$ 20	\$ 29	\$ 32					
Income taxes	702	638	736					
Dividends declared and not paid	188	165	145					

The accompanying notes to consolidated financial statements are an integral part of this statement.

## NIKE, Inc. Consolidated Statements of Shareholders' Equity

		Co	mmo	n Stock				apital in	Accumulated	d Other			
		ıss A			ss B		5	Stated	Comprehe	nsive	Re	tained	
(In millions, except per share data)			ount	Shares		unt		Value	Incom			rnings	Total
Balance at May 31, 2010	180	\$	_	788	\$	3	\$	3,441	\$	215	\$	6,095	\$ 9,754
Stock options exercised				14				368					368
Repurchase of Class B Common Stock				(48)	)			(14)				(1,857)	(1,871)
Dividends on Common stock (\$0.60 per share)												(569)	(569)
Issuance of shares to employees				2				49					49
Stock-based compensation (Note 11)								105					105
Forfeiture of shares from employees				_	-			(5)				(1)	(6)
Net income												2,133	2,133
Other Comprehensive Income										(120)	)		(120)
Balance at May 31, 2011	180	\$	_	756	\$	3	\$	3,944	\$	95	\$	5,801	\$ 9,843
Stock options exercised				18				528					528
Repurchase of Class B Common Stock				(40)	)			(12)				(1,793)	(1,805)
Dividends on Common stock (\$0.70 per share)												(639)	(639)
Issuance of shares to employees				2				57					57
Stock-based compensation (Note 11)								130					130
Forfeiture of shares from employees				_	-			(6)				(4)	(10)
Net income												2,223	2,223
Other comprehensive income										54			54
Balance at May 31, 2012	180	\$	_	736	\$	3	\$	4,641	\$	149	\$	5,588	\$ 10,381
Stock options exercised				10				322					322
Conversion to Class B Common Stock	(2)	)		2									_
Repurchase of Class B Common Stock				(34)	)			(10)			(	(1,647)	(1,657)
Dividends on Common stock (\$0.81 per share)												(727)	(727)
Issuance of shares to employees				2				65					65
Stock-based compensation (Note 11)								174					174
Forfeiture of shares from employees				_	-			(8)				(4)	(12)
Net income												2,485	2,485
Other comprehensive income										125			125
Balance at May 31, 2013	178	\$	_	716	\$	3	\$	5,184	\$	274	\$	5,695	\$ 11,156

The accompanying notes to consolidated financial statements are an integral part of this statement.

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#### NOTE 1 — Summary of Significant Accounting Policies

#### **Description of Business**

NIKE, Inc. is a worldwide leader in the design, development and worldwide marketing and selling of athletic footwear, apparel, equipment, accessories and services. Wholly-owned NIKE, Inc. subsidiaries include Converse Inc., which designs, markets and distributes casual footwear, apparel and accessories and Hurley International LLC, which designs, markets and distributes action sports and youth lifestyle footwear, apparel and accessories.

#### **Basis of Consolidation**

The consolidated financial statements include the accounts of NIKE, Inc. and its subsidiaries (the "Company"). All significant intercompany transactions and balances have been eliminated.

The Company completed the sale of Cole Haan during the third quarter ended February 28, 2013 and completed the sale of Umbro during the second quarter ended November 30, 2012. As a result, the Company reports the operating results of Cole Haan and Umbro in the net income (loss) from discontinued operations line in the consolidated statements of income for all periods presented. In addition, the assets and liabilities associated with these businesses are reported as assets of discontinued operations and liabilities of discontinued operations, as appropriate, in the consolidated balance sheets (refer to Note 15 — Discontinued Operations). Unless otherwise indicated, the disclosures accompanying the consolidated financial statements reflect the Company's continuing operations.

On November 15, 2012, the Company announced a two-for-one split of both NIKE Class A and Class B Common shares. The stock split was a 100 percent stock dividend payable on December 24, 2012 to shareholders of record at the close of business December 10, 2012. Common stock began trading at the split-adjusted price on December 26, 2012. All share numbers and per share amounts presented reflect the stock split.

#### **Recognition of Revenues**

Wholesale revenues are recognized when title and the risks and rewards of ownership have passed to the customer, based on the terms of sale. This occurs upon shipment or upon receipt by the customer depending on the country of the sale and the agreement with the customer. Retail store revenues are recorded at the time of sale. Provisions for post-invoice sales discounts, returns and miscellaneous claims from customers are estimated and recorded as a reduction to revenue at the time of sale. Post-invoice sales discounts consist of contractual programs with certain customers or discretionary discounts that are expected to be granted to certain customers at a later date. Estimates of discretionary discounts, returns and claims are based on historical rates, specific identification of outstanding claims and outstanding returns not yet received from customers, and estimated discounts, returns and claims expected but not yet finalized with customers. As of May 31, 2013 and 2012, the Company's reserve balances for post-invoice sales discounts, returns and miscellaneous claims were \$531 million and \$455 million, respectively.

#### **Cost of Sales**

Cost of sales consists primarily of inventory costs, as well as warehousing costs (including the cost of warehouse labor), third party royalties, certain foreign currency hedge gains and losses, and research, design and development costs.

#### **Shipping and Handling Costs**

Shipping and handling costs are expensed as incurred and included in cost of sales.

#### **Operating Overhead Expense**

Operating overhead expense consists primarily of payroll and benefit related costs, rent, depreciation and amortization, professional services, and meetings and travel.

#### **Demand Creation Expense**

Demand creation expense consists of advertising and promotion costs, including costs of endorsement contracts, television, digital and print advertising, brand events, and retail brand presentation. Advertising production costs are expensed the first time an advertisement is run. Advertising placement costs are expensed in the month the advertising appears, while costs related to brand events are expensed when the event occurs. Costs related to retail brand presentation are expensed when the presentation is completed and delivered.

A significant amount of the Company's promotional expenses result from payments under endorsement contracts. Accounting for endorsement payments is based upon specific contract provisions. Generally, endorsement payments are expensed on a straight-line basis over the term of the contract after giving recognition to periodic performance compliance provisions of the contracts. Prepayments made under contracts are included in prepaid expenses or other assets depending on the period to which the prepayment applies.

Some of the contracts provide for contingent payments to endorsers based upon specific achievements in their sports (e.g., winning a championship). The Company records selling and administrative expense for these amounts when the endorser achieves the specific goal.

Some of the contracts provide for payments based upon endorsers maintaining a level of performance in their sport over an extended period of time (e.g., maintaining a top ranking in a sport for a year). These amounts are recorded in selling and administrative expense when the Company determines that it is probable that the specified level of performance will be maintained throughout the period. In these instances, to the extent that actual payments to the endorser differ from our estimate due to changes in the endorser's athletic performance, increased or decreased selling and administrative expense may be recorded in a future period.

Some of the contracts provide for royalty payments to endorsers based upon a predetermined percentage of sales of particular products. The Company expenses these payments in cost of sales as the related sales occur. In certain contracts, the Company offers minimum guaranteed royalty payments. For contractual obligations for which the Company estimates it will not meet the minimum guaranteed amount of royalty fees through sales of product, the Company records the amount of the guaranteed payment in excess of that earned through sales of product in selling and administrative expense uniformly over the remaining guarantee period.

Through cooperative advertising programs, the Company reimburses retail customers for certain costs of advertising the Company's products. The Company records these costs in selling and administrative expense at the point in time when it is obligated to its customers for the costs, which is when the related revenues are recognized. This obligation may arise prior to the related advertisement being run.

Total advertising and promotion expenses were \$2,745 million, \$2,607 million, and \$2,344 million for the years ended May 31, 2013, 2012 and 2011, respectively. Prepaid advertising and promotion expenses recorded in prepaid expenses and other current assets totaled \$386 million and \$281 million at May 31, 2013 and 2012, respectively.

#### Cash and Equivalents

Cash and equivalents represent cash and short-term, highly liquid investments, including commercial paper, U.S. treasury, U.S. agency, and corporate debt securities with maturities of three months or less at date of purchase.

#### **Short-Term Investments**

Short-term investments consist of highly liquid investments, including commercial paper, U.S. treasury, U.S. agency, and corporate debt securities, with maturities over three months from the date of purchase. Debt securities that the Company has the ability and positive intent to hold to maturity are carried at amortized cost. At May 31, 2013 and 2012, the Company did not hold any short-term investments that were classified as trading or held-to-maturity.

At May 31, 2013 and 2012, short-term investments consisted of available- for-sale securities. Available-for-sale securities are recorded at fair value with unrealized gains and losses reported, net of tax, in other comprehensive income, unless unrealized losses are determined to be other than temporary. Realized gains and losses on the sale of securities are determined by specific identification. The Company considers all available-for-sale securities, including those with maturity dates beyond 12 months, as available to support current operational liquidity needs and therefore classifies all securities with maturity dates beyond three months at the date of purchase as current assets within short-term investments on the consolidated balance sheets.

Refer to Note 6 — Fair Value Measurements for more information on the Company's short-term investments.

#### **Allowance for Uncollectible Accounts Receivable**

Accounts receivable consists primarily of amounts receivable from customers. The Company makes ongoing estimates relating to the collectability of its accounts receivable and maintains an allowance for estimated losses resulting from the inability of its customers to make required payments. In determining the amount of the allowance, the Company considers historical levels of credit losses and makes judgments about the creditworthiness of significant customers based on ongoing credit evaluations. Accounts receivable with anticipated collection dates greater than 12 months from the balance sheet date and related allowances are considered non-current and recorded in other assets. The allowance for uncollectible accounts receivable was \$104 million and \$91 million at May 31, 2013 and 2012, respectively, of which \$54 million and \$45 million, respectively, was classified as long-term and recorded in other assets.

#### **Inventory Valuation**

Inventories are stated at lower of cost or market and valued primarily on an average cost basis. Inventory costs primarily consist of product cost from our suppliers, as well as freight, import duties, taxes, insurance and logistics and other handling fees.

#### **Property, Plant and Equipment and Depreciation**

Property, plant and equipment are recorded at cost. Depreciation for financial reporting purposes is determined on a straight-line basis for buildings and leasehold improvements over 2 to 40 years and for machinery and equipment over 2 to 15 years.

Depreciation and amortization of assets used in manufacturing, warehousing and product distribution are recorded in cost of sales. Depreciation and amortization of other assets are recorded in selling and administrative expense.

#### **Software Development Costs**

Internal Use Software. Expenditures for major software purchases and software developed for internal use are capitalized and amortized over a 2 to 10 year period on a straight-line basis. The Company's policy provides for the capitalization of external direct costs of materials and services associated with developing or obtaining internal use computer software. In addition, the Company also capitalizes certain payroll and payroll-related costs for employees who are directly associated with internal use computer software projects. The amount of capitalizable payroll costs with respect to these employees is limited to the time directly spent on such projects. Costs associated with preliminary project stage activities, training, maintenance and all other post-implementation stage activities are expensed as incurred.

Computer Software to be Sold, Leased or Otherwise Marketed. Development costs of computer software to be sold, leased, or otherwise marketed as an integral part of a product are subject to capitalization beginning when a product's technological feasibility has been established and ending when a product is available for general release to customers. In most instances, the Company's products are released soon after technological feasibility has been established. Therefore, costs incurred subsequent to achievement of technological feasibility are usually not significant, and generally most software development costs have been expensed as incurred.

#### Impairment of Long-Lived Assets

The Company reviews the carrying value of long-lived assets or asset groups to be used in operations whenever events or changes in circumstances indicate that the carrying amount of the assets might not be recoverable. Factors that would necessitate an impairment assessment include a significant adverse change in the extent or manner in which an asset is used, a significant adverse change in legal factors or the business climate that could affect the value of the asset, or a significant decline in the observable market value of an asset, among others. If such facts indicate a potential impairment, the Company would assess the recoverability of an asset group by determining if the carrying value of the asset group exceeds

the sum of the projected undiscounted cash flows expected to result from the use and eventual disposition of the assets over the remaining economic life of the primary asset in the asset group. If the recoverability test indicates that the carrying value of the asset group is not recoverable, the Company will estimate the fair value of the asset group using appropriate valuation methodologies, which would typically include an estimate of discounted cash flows. Any impairment would be measured as the difference between the asset group's carrying amount and its estimated fair value.

#### Identifiable Intangible Assets and Goodwill

The Company performs annual impairment tests on goodwill and intangible assets with indefinite lives in the fourth quarter of each fiscal year, or when events occur or circumstances change that would, more likely than not, reduce the fair value of a reporting unit or an intangible asset with an indefinite life below its carrying value. Events or changes in circumstances that may trigger interim impairment reviews include significant changes in business climate, operating results, planned investments in the reporting unit, planned divestitures or an expectation that the carrying amount may not be recoverable, among other factors. The Company may first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. If, after assessing the totality of events and circumstances, the Company determines that it is more likely than not that the fair value of the reporting unit is greater than its carrying amount, the two-step impairment test is unnecessary. The two-step impairment test first requires the Company to estimate the fair value of its reporting units. If the carrying value of a reporting unit exceeds its fair value, the goodwill of that reporting unit is potentially impaired and the Company proceeds to step two of the impairment analysis. In step two of the analysis, the Company measures and records an impairment loss equal to the excess of the carrying value of the reporting unit's goodwill over its implied fair value, if any.

The Company generally bases its measurement of the fair value of a reporting unit on a blended analysis of the present value of future discounted cash flows and the market valuation approach. The discounted cash flows model indicates the fair value of the reporting unit based on the present value of the cash flows that the Company expects the reporting unit to generate in the future. The Company's significant estimates in the discounted cash flows model include: its weighted average cost of capital; long-term rate of growth and profitability of the reporting unit's business; and working capital effects. The market valuation approach indicates the fair value of the business based on a comparison of the reporting unit to comparable publicly traded companies in similar lines of business. Significant estimates in the market valuation approach model include identifying similar companies with comparable business factors such as size, growth, profitability, risk and return on investment, and assessing comparable revenue and operating income multiples in estimating the fair value of the reporting unit.

Indefinite-lived intangible assets primarily consist of acquired trade names and trademarks. The Company may first perform a qualitative assessment to determine whether it is more likely than not that an indefinite-lived intangible asset is impaired. If, after assessing the totality of events and circumstances, the Company determines that it is more likely than not that the indefinite-lived intangible asset is not impaired, no quantitative fair value measurement is necessary. If a quantitative fair value measurement calculation is required for these intangible assets, the Company utilizes the relief-from-royalty method. This method assumes that trade names and trademarks have value to the extent that their owner is relieved of the obligation to pay royalties for the benefits received from them. This method requires the Company to estimate the future revenue for the related brands, the appropriate royalty rate and the weighted average cost of capital.

#### **Operating Leases**

The Company leases retail store space, certain distribution and warehouse facilities, office space, and other non-real estate assets under operating leases. Operating lease agreements may contain rent escalation clauses, rent holidays or certain landlord incentives, including tenant improvement allowances. Rent expense for non-cancelable operating leases with scheduled rent increases or landlord incentives are recognized on a straight- line basis over the lease term, beginning with the effective lease commencement date, which is generally the date in which the Company takes possession of or controls the physical use of the property. Certain leases also provide for contingent rents, which are determined as a percentage of sales in excess of specified levels. A contingent rent liability is recognized together with the corresponding rent expense when specified levels have been achieved or when the Company determines that achieving the specified levels during the period is probable.

#### **Fair Value Measurements**

The Company measures certain financial assets and liabilities at fair value on a recurring basis, including derivatives and available-for-sale securities. Fair value is the price the Company would receive to sell an asset or pay to transfer a liability in an orderly transaction with a market participant at the measurement date. The Company uses a three-level hierarchy established by the Financial Accounting Standards Board ("FASB") that prioritizes fair value measurements based on the types of inputs used for the various valuation techniques (market approach, income approach, and cost approach).

The levels of hierarchy are described below:

- Level 1: Observable inputs such as quoted prices in active markets for identical assets or liabilities.
- Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly; these include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.
- Level 3: Unobservable inputs for which there is little or no market data available, which require the reporting entity to develop its own assumptions.

The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and considers factors specific to the asset or liability. Financial assets and liabilities are classified in their entirety based on the most conservative level of input that is significant to the fair value measurement.

Pricing vendors are utilized for certain Level 1 and Level 2 investments. These vendors either provide a quoted market price in an active market or use observable inputs without applying significant adjustments in their pricing. Observable inputs include broker quotes, interest rates and yield curves observable at commonly quoted intervals, volatilities and credit risks. The Company's fair value processes include controls that are designed to ensure appropriate fair values are recorded. These controls include an analysis of period-over-period fluctuations and comparison to another independent pricing vendor.

Refer to Note 6 — Fair Value Measurements for additional information.

#### Foreign Currency Translation and Foreign Currency Transactions

Adjustments resulting from translating foreign functional currency financial statements into U.S. Dollars are included in the foreign currency translation adjustment, a component of accumulated other comprehensive income in shareholders' equity.

The Company's global subsidiaries have various assets and liabilities, primarily receivables and payables, which are denominated in currencies other than their functional currency. These balance sheet items are subject to remeasurement, the impact of which is recorded in other (income) expense, net, within the consolidated statements of income.

#### **Accounting for Derivatives and Hedging Activities**

The Company uses derivative financial instruments to reduce its exposure to changes in foreign currency exchange rates and interest rates. All derivatives are recorded at fair value on the balance sheet and changes in the fair value of derivative financial instruments are either recognized in other comprehensive income (a component of shareholders' equity), debt or net income depending on the nature of the underlying exposure, whether the derivative is formally designated as a hedge, and, if designated, the extent to which the hedge is effective. The Company classifies the cash flows at settlement from derivatives in the same category as the cash flows from the related hedged items. For undesignated hedges and designated cash flow hedges, this is within the cash provided by operations component of the consolidated statements of cash flows. For designated net investment hedges, this is generally within the cash provided or used by investing activities component of the cash flow statement. As our fair value hedges are receive-fixed, pay- variable interest rate swaps, the cash flows associated with these derivative instruments are periodic interest payments while the swaps are outstanding. These cash flows are reflected within the cash provided by operations component of the cash flow statement.

Refer to Note 17 — Risk Management and Derivatives for more information on the Company's risk management program and derivatives.

#### **Stock-Based Compensation**

The Company estimates the fair value of options and stock appreciation rights granted under the NIKE, Inc. 1990 Stock Incentive Plan (the "1990 Plan") and employees' purchase rights under the Employee Stock Purchase Plans ("ESPPs") using the Black-Scholes option pricing model. The Company recognizes this fair value, net of estimated forfeitures, as selling and administrative expense in the consolidated statements of income over the vesting period using the straight-line method.

Refer to Note 11 — Common Stock and Stock-Based Compensation for more information on the Company's stock programs.

#### **Income Taxes**

The Company accounts for income taxes using the asset and liability method. This approach requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of temporary differences between the carrying amounts and the tax basis of assets and liabilities. The Company records a valuation allowance to reduce deferred tax assets to the amount management believes is more likely than not to be realized. United States income taxes are provided currently on financial statement earnings of non-U.S. subsidiaries that are expected to be repatriated. The Company determines annually the amount of undistributed non-U.S. earnings to invest indefinitely in its non-U.S. operations.

The Company recognizes a tax benefit from uncertain tax positions in the financial statements only when it is more likely than not that the position will be sustained upon examination by relevant tax authorities. The Company recognizes interest and penalties related to income tax matters in income tax expense.

Refer to Note 9 — Income Taxes for further discussion.

#### **Earnings Per Share**

Basic earnings per common share is calculated by dividing net income by the weighted average number of common shares outstanding during the year. Diluted earnings per common share is calculated by adjusting weighted average outstanding shares, assuming conversion of all potentially dilutive stock options and awards.

Refer to Note 12 — Earnings Per Share for further discussion.

#### **Management Estimates**

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates, including estimates relating to assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from these estimates.

#### Recently Adopted Accounting Standards

In July 2012, the FASB issued an accounting standards update intended to simplify how an entity tests indefinite-lived intangible assets other than goodwill for impairment by providing entities with an option to perform a qualitative assessment to determine whether further impairment testing is necessary. This accounting standard update will be effective for the Company beginning June 1, 2013, and early adoption is permitted. The Company early adopted this standard and the adoption did not have a material impact on its consolidated financial position or results of operations.

In September 2011, the FASB issued updated guidance on the periodic testing of goodwill for impairment. This guidance will allow companies to assess qualitative factors to determine if it is more-likely-than-not that goodwill might be impaired and whether it is necessary to perform the two-step goodwill impairment test required under current accounting standards. This new guidance was effective for the Company beginning June 1, 2012 and the adoption did not have a material effect on its consolidated financial position or results of operations.

In June 2011, the FASB issued guidance on the presentation of comprehensive income. This new guidance eliminates the current option to report other comprehensive income and its components in the statement of shareholders' equity. Companies are now required to present the components

of net income and other comprehensive income in either one continuous statement, referred to as the statement of comprehensive income, or in two separate, but consecutive statements. This requirement was effective for the Company beginning June 1, 2012. As this guidance only amended the presentation of the components of comprehensive income, the adoption did not have an impact on the Company's consolidated financial position or results of operations. Further, this guidance required companies to present reclassification adjustments out of accumulated other comprehensive income by component in both the statement in which net income is presented and the statement in which other comprehensive income is presented. This requirement will be effective for the Company beginning June 1, 2013. As this guidance only amends the presentation of the components of comprehensive income, the Company does not anticipate the adoption will have an impact on the Company's consolidated financial position or results of operations.

#### **Recently Issued Accounting Standards**

In December 2011, the FASB issued guidance enhancing disclosure requirements surrounding the nature of an entity's right to offset and related arrangements associated with its financial instruments and derivative instruments. This new guidance requires companies to disclose both gross and net information about instruments and transactions eligible for offset in the statement of financial position and instruments and transactions subject to master netting arrangements. This new guidance is effective for the Company beginning June 1, 2013. As this guidance only requires expanded disclosures, the Company does not anticipate the adoption will have an impact on its consolidated financial position or results of operations.

#### NOTE 2 — Inventories

Inventory balances of \$3,434 million and \$3,222 million at May 31, 2013 and 2012, respectively, were substantially all finished goods.

#### NOTE 3 — Property, Plant and Equipment

Property, plant and equipment included the following:				
		May 31,		
_(In millions)	2	013		2012
Land	\$	268	\$	252
Buildings		1,174		1,158
Machinery, equipment and internal-use software		2,985		2,654
Leasehold improvements		945		883
Construction in process		128		110
Total property, plant and equipment, gross		5,500		5,057
Less accumulated depreciation		3,048		2,848
TOTAL PROPERTY, PLANT AND EQUIPMENT, NET	\$	2,452	\$	2,209

Capitalized interest was not material for the years ended May 31, 2013, 2012, and 2011. The Company had \$81 million in capital lease obligations as of May 31, 2013 included in machinery, equipment, and internal-use software; there were no capital lease obligations as of May 31, 2012.

### NOTE 4 — Identifiable Intangible Assets and Goodwill

The following table summarizes the Company's identifiable intangible asset balances as of May 31, 2013 and 2012:

	As of May 31, 2013					As of May 31, 2012						
(In millions)		Carrying nount		umulated ortization		Carrying mount		s Carrying mount		umulated ortization		Carrying mount
Amortized intangible assets:												
Patents	\$	119	\$	(35)	\$	84	\$	99	\$	(29)	\$	70
Trademarks		43		(32)		11		40		(26)		14
Other		20		(16)		4		19		(16)		3
TOTAL	\$	182	\$	(83)	\$	99	\$	158	\$	(71)	\$	87
Unamortized intangible assets — Trademarks						283						283
IDENTIFIABLE INTANGIBLE ASSETS, NET					\$	382					\$	370

Amortization expense, which is included in selling and administrative expense, was \$14 million, \$14 million, and \$13 million for the years ended May 31, 2013, 2012, and 2011, respectively. The estimated amortization expense for intangible assets subject to amortization for each of the years ending May 31, 2014 through May 31, 2018 are as follows: 2014: \$13 million; 2015: \$9 million; 2016: \$9 million; 2017: \$7 million; 2018: \$6 million

Goodwill was \$131 million at May 31, 2013 and May 31, 2012, respectively, and is included in the Company's "Other" category for segment reporting purposes. There were no accumulated impairment balances for goodwill as of either period end.

#### NOTE 5 — Accrued Liabilities

Accrued liabilities included the following:

	As of May 31,		
_(In millions)	2013	2012	
Compensation and benefits, excluding taxes	\$ 713	\$ 691	
Endorsement compensation	264	288	
Taxes other than income taxes	192	169	
Dividends payable	188	165	
Import and logistics costs	111	133	
Advertising and marketing	77	94	
Fair value of derivatives	34	55	
Other ⁽¹⁾	407	346	
TOTAL ACCRUED LIABILITIES	\$ 1,986	\$ 1,941	

⁽¹⁾ Other consists of various accrued expenses with no individual item accounting for more than 5% of the balance at May 31, 2013 and 2012.

#### NOTE 6 — Fair Value Measurements

The following table presents information about the Company's financial assets and liabilities measured at fair value on a recurring basis as of May 31, 2013 and 2012, and indicates the fair value hierarchy of the valuation techniques utilized by the Company to determine such fair value. Refer to Note 1 – Summary of Significant Accounting Policies for additional detail regarding the Company's fair value measurement methodology.

	As of May 31, 2013					
		Fair Valu	-			
(In millions)	Measurements Using Assets/Liabilities Level 1 Level 2 Level 3 at Fair Value				Balance Sheet Classification	
ASSETS					24:4:100 0:100 0:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:100 1:10	
Derivatives:						
Foreign exchange forwards and options	\$ —	- \$ 278	\$ —	\$ 278	Other current assets and other long-term assets	
Interest rate swap contracts	_	- 11	_	11	Other current assets and other long-term assets	
Total derivatives	_	289	_	289		
Available-for-sale securities:						
U.S. Treasury securities	425	_	_	425	Cash and equivalents	
U.S. Agency securities	_	20	_	20	Cash and equivalents	
Commercial paper and bonds	_	1,035	_	1,035	Cash and equivalents	
Money market funds	_	836	_	836	Cash and equivalents	
U.S. Treasury securities	1,583	_	_	1,583	Short-term investments	
U.S. Agency securities	_	401	_	401	Short-term investments	
Commercial paper and bonds	_	644	_	644	Short-term investments	
Non-marketable preferred stock	_	_	5	5	Other long-term assets	
Total available-for-sale securities	2,008	2,936	5	4,949		
TOTAL ASSETS	\$ 2,008	\$ 3,225	\$ 5	\$ 5,238		
LIABILITIES						
Derivatives:						
Foreign exchange forwards and options	\$ —	\$ 34	\$ —	\$ 34	Accrued liabilities and other long-term liabilities	
TOTALLIABILITIES	\$ <b>—</b>	\$ 34	\$ <b>—</b>	\$ 34		

					As	of May 31	, 2012
		Meas	 ir Value ements	na	-	ssets / bilities at	
(In millions)	L	evel 1	evel 2	evel 3		ir Value	<b>Balance Sheet Classification</b>
ASSETS							
Derivatives:							
Foreign exchange forwards and options	\$	_	\$ 265	\$ _	\$	265	Other current assets and other long- term assets
Embedded derivatives		_	1	_		1	Other current assets
Interest rate swap contracts		_	15	_		15	Other current assets and other long- term assets
Total derivatives		_	281	_		281	
Available-for-sale securities:							
U.S. Treasury securities		226	_	_		226	Cash and equivalents
U.S. Agency securities		_	254	_		254	Cash and equivalents
Commercial paper and bonds		_	159	_		159	Cash and equivalents
Money market funds		_	770			770	Cash and equivalents
U.S. Treasury securities		927	_	_		927	Short-term investments
U.S. Agency securities		_	230	_		230	Short-term investments
Commercial paper and bonds		_	283	_		283	Short-term investments
Non-marketable preferred stock		_	_	3		3	Other long-term assets
Total available-for-sale securities		1,153	1,696	3		2,852	
TOTAL ASSETS	\$	1,153	\$ 1,977	\$ 3	\$	3,133	
LIABILITIES							
Derivatives:							
Foreign exchange forwards and options	\$	_	\$ 55	\$ 	\$	55	Accrued liabilities and other long-term liabilities
TOTAL LIABILITIES	\$	_	\$ 55	\$ _	\$	55	

Derivative financial instruments include foreign exchange forwards and options, embedded derivatives and interest rate swap contracts. The fair value of derivative contracts is determined using observable market inputs such as the daily market foreign currency rates, forward pricing curves, currency volatilities, currency correlations and interest rates, and considers nonperformance risk of the Company and that of its counterparties. Adjustments relating to these nonperformance risks were not material at May 31, 2013 or 2012. Refer to Note 17 — Risk Management and Derivatives for additional detail.

Available-for-sale securities comprise investments in U.S. Treasury and Agency securities, money market funds, corporate commercial paper and bonds. These securities are valued using market prices on both active markets (Level 1) and less active markets (Level 2). Pricing vendors are utilized for certain Level 1 or Level 2 investments. These vendors either provide a quoted market price in an active market or use observable inputs without applying significant adjustments in their pricing. Observable inputs include broker quotes, interest rates and yield curves observable at commonly quoted intervals, volatilities and credit risks. The carrying amounts reflected in the consolidated balance sheets for short-term investments and cash and equivalents approximate fair value.

The Company's Level 3 assets comprise investments in certain non-marketable preferred stock. These investments are valued using internally developed models with unobservable inputs. These Level 3 investments are an immaterial portion of our portfolio. Changes in Level 3 investment assets were immaterial during the years ended May 31, 2013 and 2012.

No transfers among the levels within the fair value hierarchy occurred during the years ended May 31, 2013 or 2012.

As of May 31, 2013 and 2012, the Company had no assets or liabilities that were required to be measured at fair value on a non-recurring basis.

#### **Short-Term Investments**

As of May 31, 2013 and 2012, short-term investments consisted of available- for-sale securities. As of May 31, 2013, the Company held \$2,229 million of available-for-sale securities with maturity dates within one year from the purchase date and \$399 million with maturity dates over one year and less than five years from the purchase date within short-term investments. As of May 31, 2012, the Company held \$1,129 million of available-for-sale securities with maturity dates within one year from purchase date and \$311 million with maturity dates over one year and less than five years from purchase date within short-term investments.

#### **B-16** Appendix B Nike Inc., Form 10-K For the Fiscal Year Ended May 31, 2013

Short-term investments classified as available-for-sale consist of the following at fair value:

	As of Ma	ay 31	y 31,		
(In millions)	2013		2012		
Available-for-sale investments:					
U.S. treasury and agencies	\$ 1,984	\$	1,157		
Commercial paper and bonds	644		283		
TOTAL ACCRUED LIABILITIES	\$ 2,628	\$	1,440		

Included in interest (income) expense, net was interest income related to cash and equivalents and short-term investments of \$26 million, \$27 million, and \$28 million for the years ended May 31, 2013, 2012, and 2011, respectively.

For fair value information regarding notes payable and long-term debt, refer to Note 7 — Short-Term Borrowings and Credit Lines and Note 8 — Long-Term Debt.

#### NOTE 7 — Short-Term Borrowings and Credit Lines

Notes payable and interest-bearing accounts payable to Sojitz Corporation of America ("Sojitz America") as of May 31, 2013 and 2012, are summarized below:

	As of May 31,						
	 2	013		2012			
(In millions)	Borrowings	Interest Rate	Borro	wings	Interest Rate		
Notes payable:							
U.S. operations	\$ 20	0.00% ⁽¹⁾	\$	30	5.50% ⁽¹⁾		
Non-U.S. operations	101	4.77% ⁽¹⁾		78	9.46% (1)		
TOTAL NOTES PAYABLE	\$ 121		\$	108			
Interest-Bearing Accounts Payable:							
Sojitz America	\$ 55	0.99%	\$	75	1.10%		

⁽¹⁾ Weighted average interest rate includes non-interest bearing overdrafts.

The carrying amounts reflected in the consolidated balance sheets for notes payable approximate fair value.

The Company purchases through Sojitz America certain athletic footwear, apparel and equipment it acquires from non-U.S. suppliers. These purchases are for the Company's operations outside of the United States, Europe and Japan. Accounts payable to Sojitz America are generally due up to 60 days after shipment of goods from the foreign port. The interest rate on such accounts payable is the 60-day London Interbank Offered Rate ("LIBOR") as of the beginning of the month of the invoice date, plus 0.75%.

As of May 31, 2013 and 2012, the Company had no amounts outstanding under its commercial paper program.

In November 2011, the Company entered into a committed credit facility agreement with a syndicate of banks which provides for up to \$1 billion of borrowings pursuant to a revolving credit facility with the option to increase borrowings to \$1.5 billion with lender approval. The facility matures on November 1, 2016, with a one-year extension option prior to both the second and third anniversary of the closing date, provided that extensions shall not extend beyond November 1, 2018. Based on the Company's current long- term senior unsecured debt ratings of A+ and A1 from Standard and Poor's Corporation and Moody's Investor Services, respectively, the interest rate charged on any outstanding borrowings would be the prevailing LIBOR plus 0.56%. The facility fee is 0.065% of the total commitment. Under this committed credit facility, the Company must maintain, among other things, certain minimum specified financial ratios with which the Company was in compliance at May 31, 2013. No amounts were outstanding under this facility as of May 31, 2013 or 2012.

#### NOTE 8 — Long-Term Debt

Long-term debt, net of unamortized premiums and discounts and swap fair value adjustments, comprises the following:

					Book Value ( As of N	
Scheduled Maturity (Dollars in millions)	Origina Principa		Interest Rate	Interest Payments	2013	2012
Corporate Bond Payables: (4)						
July 23, 2012 ⁽¹⁾	\$	25	5.66%	Semi-Annually	\$	\$ 25
August 7, 2012 ⁽¹⁾	\$	15	5.40%	Semi-Annually	_	15
October 1, 2013	\$	50	4.70%	Semi-Annually	50	50
October 15, 2015 ⁽¹⁾	\$	100	5.15%	Semi-Annually	111	115
May 1, 2023 ⁽⁵⁾	\$	500	2.25%	Semi-Annually	499	_
May 1, 2043 ⁽⁵⁾	\$	500	3.63%	Semi-Annually	499	_
Promissory Notes: ⁽²⁾						
April 1, 2017	\$	40	6.20%	Monthly	40	_
January 1, 2018	\$	19	6.79%	Monthly	19	_
Japanese Yen Notes:					34	
August 20, 2001 through November 20, 2020 (3)	¥	9,000	2.60%	Quarterly		50
August 20, 2001 through November 20, 2020 (3)	¥	4,000	2.00%	Quarterly	15	22
Total					1,267	277
Less current maturities					57	49
TOTAL LONG-TERM DEBT					\$ 1,210	\$ 228

- (1) The Company has entered into interest rate swap agreements whereby the Company receives fixed interest payments at the same rate as the note and pays variable interest payments based on the six-month LIBOR plus a spread. The swaps have the same notional amount and maturity date as the corresponding note. At May 31, 2013, the interest rates payable on these swap agreements ranged from approximately 0.3% to 0.4%.
- (2) The Company assumed a total of \$59 million in bonds payable on May 30, 2013 as part of its agreement to purchase certain Corporate properties, which was treated as a non-cash financing transaction. The property serves as collateral for the debt. The purchase of these properties was accounted for as a business combination where the total consideration of \$85 million was allocated to the land and buildings acquired; no other tangible or intangible assets or liabilities resulted from the purchase. The bonds mature in 2017 and 2018 and the Company does not have the ability to re-negotiate the terms of the debt agreements and would incur significant financial penalties if the notes are paid off prior to maturity.
- (3) NIKE Logistics YK assumed a total of \(\pm 13.0\) billion in loans as part of its agreement to purchase a distribution center in Japan, which serves as collateral for the loans. These loans mature in equal quarterly installments during the period August 20, 2001 through November 20, 2020.
- (4) Senior unsecured obligations rank equally with our other unsecured and unsubordinated indebtedness.
- (5) The bonds carry a make whole call provision and are redeemable at any time prior to maturity. The bonds also feature a par call provision payable 3 months and 6 months prior to the scheduled maturity date for the bonds maturing on May 1, 2023 and May 1, 2043, respectively.

The scheduled maturity of long-term debt in each of the years ending May 31, 2014 through 2018 are \$57 million, \$7 million, \$108 million, \$45 million and \$25 million, respectively, at face value.

The fair value of the Company's long-term debt, including the current portion, was approximately \$1,219 million at May 31, 2013 and \$283 million at May 31, 2012. The fair value of long-term debt is estimated based upon quoted prices of similar instruments (level 2).

#### NOTE 9 — Income Taxes

Income before income taxes is as follows:

		y 31,	31,		
(In millions)		2013	2012		2011
Income before income taxes:					
United States	\$	1,240	\$ 804	\$	1,040
Foreign		2,032	2,221		1,822
TOTAL INCOME BEFORE INCOME TAXES	\$	3,272	\$ 3,025	\$	2,862

#### **B-18** Appendix B Nike Inc., Form 10-K For the Fiscal Year Ended May 31, 2013

The provision for income taxes is as follows:

	Year Ended May 31,			
(In millions)	2013	2012	2011	
Current:				
United States				
Federal	\$ 434	\$ 289 \$	298	
State	69	51	57	
Foreign	398	488	435	
Total	901	828	790	
Deferred:				
United States				
Federal	1	(48)	(62)	
State	(4)	5	_	
Foreign	(90)	(29)	(38)	
Total	(93)	(72)	(100)	
TOTAL INCOME TAX EXPENSE	\$ 808	\$ 756 \$	690	

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A reconciliation from the U.S. statutory federal income tax rate to the effective income tax rate is as follows:

		Year Ended May 31,				
	2013	2012	2011			
Federal income tax rate	35.0%	35.0%	35.0%			
State taxes, net of federal benefit	1.4%	1.3%	1.3%			
Foreign earnings	-11.8%	-11.9%	-11.4%			
Other, net	0.1%	0.6%	-0.8%			
EFFECTIVE INCOME TAX RATE	24.7%	25.0%	24.1%			

The effective tax rate from continuing operations for the year ended May 31, 2013 was 30 basis points lower than the effective tax rate from continuing operations for the year ended May 31, 2012 primarily due to tax benefits received from the intercompany sale of intellectual property rights outside of the U.S., the retroactive reinstatement of the research and development credit and the intra-period allocation of tax expense between continuing operations, discontinued operations, and other comprehensive income. The decrease in the effective tax rate was partially offset by a higher effective tax rate on operations as a result of an increase in earnings in higher tax jurisdictions. The effective tax rate from continuing operations for the year ended May 31, 2012 was 90 basis points higher than the effective tax rate from continuing operations for the year ended May 31, 2011 primarily due to the changes in uncertain tax positions partially offset by a reduction in the effective rate related to a decrease in earnings in higher tax jurisdictions.

Deferred tax assets and (liabilities) comprise the following:

	As of	May 31,
(In millions)	2013	2012
Deferred tax assets:		
Allowance for doubtful accounts	\$ 20	\$ 17
Inventories	40	37
Sales return reserves	101	84
Deferred compensation	197	186
Stock-based compensation	140	126
Reserves and accrued liabilities	66	66
Foreign loss carry-forwards	19	35
Foreign tax credit carry-forwards	106	216
Undistributed earnings of foreign subsidiaries	162	82
Other	47	62
Total deferred tax assets	898	911
Valuation allowance	(5	(27)
Total deferred tax assets after valuation allowance	893	884
Deferred tax liabilities:		
Property, plant and equipment	(241	(191)
Intangibles	(96	(98)
Other	(20	(22)
Total deferred tax liability	(357	<mark>')</mark> (311)
NET DEFERRED TAX ASSET	\$ 536	\$ 573

The following is a reconciliation of the changes in the gross balance of unrecognized tax benefits:

	As of May 31,										
(In millions)		2013	2012			2011					
Unrecognized tax benefits, as of the beginning of the period	\$	285	\$	212	\$	282					
Gross increases related to prior period tax positions		77		48		13					
Gross decreases related to prior period tax positions		(3)		(25)		(98)					
Gross increases related to current period tax positions		130		91		59					
Gross decreases related to current period tax positions		(9)		(1)		(6)					
Settlements		_		(20)		(43)					
Lapse of statute of limitations		(21)		(9)		(8)					
Changes due to currency translation		(12)		(11)		13					
UNRECOGNIZED TAX BENEFITS, AS OF THE END OF THE PERIOD	\$	447	\$	285	\$	212					

As of May 31, 2013, the total gross unrecognized tax benefits, excluding related interest and penalties, were \$447 million, \$281 million of which would affect the Company's effective tax rate if recognized in future periods.

The Company recognizes interest and penalties related to income tax matters in income tax expense. The liability for payment of interest and penalties increased \$4 million, \$17 million, and \$10 million during the years ended May 31, 2013, 2012, and 2011, respectively. As of May 31, 2013 and 2012, accrued interest and penalties related to uncertain tax positions was \$112 million and \$108 million, respectively (excluding federal benefit).

The Company is subject to taxation primarily in the U.S., China, the Netherlands, and Brazil, as well as various state and other foreign jurisdictions. The Company has concluded substantially all U.S. federal income tax matters through fiscal 2010. The Company is currently under audit by the Internal Revenue Service for the 2011 through 2013 tax years. Many issues are at an advanced stage in the examination process, the most significant of which includes the negotiation of a U.S. Unilateral Advanced Pricing Agreement that covers intercompany transfer pricing issues for fiscal years May 31, 2011 through May 31, 2015. In addition, the Company is in appeals regarding the validation of foreign tax credits taken. The Company's major foreign jurisdictions, China, the Netherlands and Brazil, have concluded substantially all income tax matters through calendar 2005, fiscal 2007 and calendar 2006, respectively. Although the timing of resolution of audits is not certain, the Company evaluates all domestic and foreign audit issues in the aggregate, along with the expiration of applicable statutes of limitations, and estimates that it is reasonably possible the total gross unrecognized tax benefits could decrease by up to \$86 million within the next 12 months.

We provide for United States income taxes on the undistributed earnings of foreign subsidiaries unless they are considered indefinitely reinvested outside the United States. At May 31, 2013, the indefinitely reinvested earnings in foreign subsidiaries upon which United States income taxes have not been provided was approximately \$6.7 billion. If these undistributed earnings were repatriated to the United States, or if the shares of the relevant foreign subsidiaries were sold or otherwise transferred, they would generate foreign tax credits that would reduce the federal tax liability associated with the foreign dividend or the otherwise taxable transaction. Assuming a full utilization of the foreign tax credits, the potential net deferred tax liability associated with these temporary differences of undistributed earnings would be approximately \$2.2 billion at May 31, 2013.

A portion of the Company's foreign operations are benefiting from a tax holiday, which will phase out in 2019. This tax holiday may be extended when certain conditions are met or may be terminated early if certain conditions are not met. The impact of this tax holiday decreased foreign taxes

by \$108 million, \$117 million, and \$36 million for the fiscal years ended May 31, 2013, 2012, and 2011, respectively. The benefit of the tax holiday on net income per share (diluted) was \$0.12, \$0.12, and \$0.04 for the fiscal years ended May 31, 2013, 2012, and 2011, respectively.

Deferred tax assets at May 31, 2013 and 2012 were reduced by a valuation allowance relating to tax benefits of certain subsidiaries with operating losses. The net change in the valuation allowance was a decrease of \$22 million, an increase of \$23 million, and a decrease of \$1 million for the years ended May 31, 2013, 2012, and 2011, respectively.

The Company does not anticipate that any foreign tax credit carry-forwards will expire unutilized.

The Company has available domestic and foreign loss carry-forwards of \$58 million at May 31, 2013. Such losses will expire as follows:

	Year Ending May 31,											
(In millions)		2014	2015	2016	2017	2018-2032	Indefinite		Total			
Net Operating Losses	\$	_	_	2	_	52	4	\$	58			

During the years ended May 31, 2013, 2012, and 2011, income tax benefits attributable to employee stock-based compensation transactions of \$76 million, \$120 million, and \$68 million, respectively, were allocated to shareholders' equity.

#### NOTE 10 — Redeemable Preferred Stock

Sojitz America is the sole owner of the Company's authorized Redeemable Preferred Stock, \$1 par value, which is redeemable at the option of Sojitz America or the Company at par value aggregating \$0.3 million. A cumulative dividend of \$0.10 per share is payable annually on May 31 and no dividends may be declared or paid on the common stock of the Company unless dividends on the Redeemable Preferred Stock have been declared and paid in full. There have been no changes in the Redeemable Preferred Stock in the three years ended May 31, 2013, 2012, and 2011. As the holder of the Redeemable Preferred Stock, Sojitz America does not have general voting rights but does have the right to vote as a separate class on the sale of all or substantially all of the assets of the Company and its subsidiaries, on merger, consolidation, liquidation or dissolution of the Company or on the sale or assignment of the NIKE trademark for athletic footwear sold in the United States. The Redeemable Preferred Stock has been fully issued to Sojitz America and is not blank check preferred stock. The Company's articles of incorporation do not permit the issuance of additional preferred stock.

#### NOTE 11 — Common Stock and Stock-Based Compensation

The authorized number of shares of Class A Common Stock, no par value, and Class B Common Stock, no par value, are 200 million and 1,200 million, respectively. Each share of Class A Common Stock is convertible into one share of Class B Common Stock. Voting rights of Class B Common Stock are limited in certain circumstances with respect to the election of directors. There are no differences in the dividend and liquidation preferences or participation rights of the Class A and Class B common shareholders.

In 1990, the Board of Directors adopted, and the shareholders approved, the NIKE, Inc. 1990 Stock Incentive Plan (the "1990 Plan"). The 1990 Plan provides for the issuance of up to 326 million previously unissued shares of Class B Common Stock in connection with stock options and other awards granted under the plan. The 1990 Plan authorizes the grant of non-statutory stock options, incentive stock options, stock appreciation rights, restricted stock, restricted stock units, and performance-based awards. The exercise price for stock options and stock appreciation rights may not be less than the fair market value of the underlying shares on the date of grant. A committee of the Board of Directors administers the 1990 Plan. The committee has the authority to determine the employees to whom awards will be made, the amount of the awards, and the other terms and conditions of the awards. Substantially all stock option grants outstanding under the 1990 Plan were granted in the first quarter of each fiscal year, vest ratably over four years, and expire 10 years from the date of grant.

The following table summarizes the Company's total stock-based compensation expense recognized in selling and administrative expense:

	Year Ended May 31,							
(In millions)	2013		2012		201	1		
Stock options (1)	\$	123	\$	96	\$	77		
ESPPs		19		16		14		
Restricted stock		32		18		14		
TOTAL STOCK-BASED COMPENSATION EXPENSE	\$	174	\$	130	\$	105		

⁽¹⁾ Expense for stock options includes the expense associated with stock appreciation rights. Accelerated stock option expense is recorded for employees eligible for accelerated stock option vesting upon retirement. Accelerated stock option expense for years ended May 31, 2013, 2012, and 2011 was \$22 million, \$17 million, and \$12 million, respectively.

As of May 31, 2013, the Company had \$199 million of unrecognized compensation costs from stock options, net of estimated forfeitures, to be recognized as selling and administrative expense over a weighted average period of 2.3 years.

The weighted average fair value per share of the options granted during the years ended May 31, 2013, 2012, and 2011, as computed using the Black-Scholes pricing model, was \$12.71, \$11.08, and \$8.84, respectively. The weighted average assumptions used to estimate these fair values are as follows:

	Ye	Year Ended May 31,						
	2013	2012	2011					
Dividend yield	1.5%	1.4%	1.6%					
Expected volatility	35.0%	29.5%	31.5%					
Weighted average expected life (in years)	5.3	5.0	5.0					
Risk-free interest rate	0.6%	1.4%	1.7%					

The Company estimates the expected volatility based on the implied volatility in market traded options on the Company's common stock with a term greater than one year, along with other factors. The weighted average expected life of options is based on an analysis of historical and expected future exercise patterns. The interest rate is based on the U.S. Treasury (constant maturity) risk-free rate in effect at the date of grant for periods corresponding with the expected term of the options.

The following summarizes the stock option transactions under the plan discussed above:

	Shares ⁽¹⁾	Weighted Average Option Price	)
	(In millions)		
Options outstanding May 31, 2010	72.2	\$ 23.3	10
Exercised	(14.0)	21.3	5
Forfeited	(1.3)	29.0	13
Granted	12.7	34.6	0
Options outstanding May 31, 2011	69.6	\$ 25.6	55
Exercised	(18.0)	22.8	31
Forfeited	(1.0)	35.6	1
Granted	13.7	45.8	37
Options outstanding May 31, 2012	64.3	\$ 30.5	9
Exercised	(9.9)	24.7	0
Forfeited	(1.3)	40.1	4
Granted	14.6	46.5	55
Options outstanding May 31, 2013	67.7	\$ 34.7	2
Options exercisable at May 31,			
2011	40.1	\$ 22.0	13
2012	33.9	24.3	8
2013	35.9	27.7	0

⁽¹⁾ Includes stock appreciation rights transactions.

The weighted average contractual life remaining for options outstanding and options exercisable at May 31, 2013 was 6.3 years and 4.7 years, respectively. The aggregate intrinsic value for options outstanding and exercisable at May 31, 2013 was \$1,823 million and \$1,218 million, respectively. The aggregate intrinsic value was the amount by which the market value of the underlying stock exceeded the exercise price of the options. The total intrinsic value of the options exercised during the years ended May 31, 2013, 2012, and 2011 was \$293 million, \$453 million, and \$267 million, respectively.

In addition to the 1990 Plan, the Company gives employees the right to purchase shares at a discount to the market price under employee stock purchase plans ("ESPPs"). Employees are eligible to participate through payroll deductions of up to 10% of their compensation. At the end of each six- month offering period, shares are purchased by the participants at 85% of the lower of the fair market value at the beginning or the end of the offering period. Employees purchased 1.6 million, 1.7 million, and 1.6 million shares during each of the three years ended May 31, 2013, 2012 and 2011, respectively.

From time to time, the Company grants restricted stock units and restricted stock to key employees under the 1990 Plan. The number of shares underlying such awards granted to employees during the years ended May 31, 2013, 2012, and 2011 were 1.6 million, 0.7 million, and 0.4 million with weighted average values per share of \$46.86, \$49.49, and \$35.11, respectively. Recipients of restricted stock are entitled to cash dividends and to vote their respective shares throughout the period of restriction. Recipients of restricted stock units are entitled to dividend equivalent cash payments upon vesting. The value of all grants of restricted stock and restricted stock units was established by the market price on the date of grant. During the years ended May 31, 2013, 2012, and 2011, the aggregate fair value of restricted stock and restricted stock units vested was \$25 million, \$22 million, and \$15 million, respectively, determined as of the date of vesting.

#### NOTE 12 — Earnings Per Share

The following is a reconciliation from basic earnings per share to diluted earnings per share. Options to purchase an additional 0.1 million, 0.2 million, and 0.3 million shares of common stock were outstanding at May 31, 2013, 2012, and 2011 respectively, but were not included in the computation of diluted earnings per share because the options were anti-dilutive.

	Year Ended May 31,										
(In millions, except per share data)		2013		2012		2011					
Determination of shares:											
Weighted average common shares outstanding		897.3		920.0		951.1					
Assumed conversion of dilutive stock options and awards		19.1		19.6		20.2					
DILUTED WEIGHTED AVERAGE COMMON SHARES OUTSTANDING		916.4		939.6		971.3					
Earnings per share from continuing operations:											
Basic earnings per common share	\$	2.75	\$	2.47	\$	2.28					
Diluted earnings per common share	\$	2.69	\$	2.42	\$	2.24					
Earnings per share from discontinued operations:											
Basic earnings per common share	\$	0.02	\$	(0.05)	\$	(0.04)					
Diluted earnings per common share	\$	0.02	\$	(0.05)	\$	(0.04)					
Basic earnings per common share for NIKE, Inc.	\$	2.77	\$	2.42	\$	2.24					
Diluted earnings per common share for NIKE, Inc.	\$	2.71	\$	2.37	\$	2.20					

#### NOTE 13 — Benefit Plans

The Company has a profit sharing plan available to most U.S.-based employees. The terms of the plan call for annual contributions by the Company as determined by the Board of Directors. A subsidiary of the Company also had a profit sharing plan available to its U.S.-based employees prior to fiscal 2012. The terms of the plan called for annual contributions as determined by the subsidiary's executive management. Contributions of \$47 million, \$40 million, and \$39 million were made to the plans and are included in selling and administrative expense for the years ended May 31, 2013, 2012, and 2011, respectively. The Company has various 401(k) employee savings plans available to U.S.-based employees. The Company matches a portion of employee contributions. Company contributions to the savings plans were \$46 million, \$42 million, and \$38 million for the years ended May 31, 2013, 2012, and 2011, respectively, and are included in selling and administrative expense.

The Company also has a Long-Term Incentive Plan ("LTIP") that was adopted by the Board of Directors and approved by shareholders in September 1997 and later amended in fiscal 2007. The Company recognized \$50 million, \$51 million, and \$31 million of selling and administrative expense related to cash awards under the LTIP during the years ended May 31, 2013, 2012, and 2011, respectively.

The Company has pension plans in various countries worldwide. The pension plans are only available to local employees and are generally government mandated. The liability related to the unfunded pension liabilities of the plans was \$104 million and \$113 million at May 31, 2013 and May 31, 2012, respectively, which was primarily classified as long-term in other liabilities.

### NOTE 14 — Accumulated Other Comprehensive Income

The components of accumulated other comprehensive income, net of tax, are as follows:

		31		
(In millions)	2013		2012	2
Cumulative translation adjustment and other	\$	(14)	\$	(127)
Net deferred gain on cash flow hedge derivatives		193		181
Net deferred gain on net investment hedge derivatives		95		95
ACCUMULATED OTHER COMPREHENSIVE INCOME	\$	274	\$	149

Refer to Note 17 — Risk Management and Derivatives for more information on the Company's risk management program and derivatives.

### **NOTE 15** — Discontinued Operations

The Company continually evaluates its existing portfolio of businesses to ensure resources are invested in those businesses that are accretive to the NIKE Brand and represent the largest growth potential and highest returns. During the year, the Company divested of Umbro and Cole Haan, allowing it to focus its resources on driving growth in the NIKE, Jordan, Converse and Hurleybrands.

On February 1, 2013, the Company completed the sale of Cole Haan to Apax Partners for an agreed upon purchase price of \$570 million and received at closing \$561 million, net of \$9 million of purchase price adjustments. The transaction resulted in a gain on sale of \$231 million, net of \$137 million in tax expense; this gain is included in the net income (loss) from discontinued operations line item on the consolidated statements of income. There were no adjustments to these recorded amounts as of May 31, 2013. Beginning November 30, 2012, the Company classified the Cole Haan disposal group as held-for-sale and presented the results of Cole Haan's operations in the net income (loss) from discontinued operations line item on the consolidated statements of income. From this date until the sale, the assets and liabilities of Cole Haan were recorded in the assets of discontinued operations and liabilities of discontinued operations line items on the consolidated balance sheets, respectively. Previously, these amounts were reported in the Company's segment presentation as "Other Businesses."

Under the sale agreement, the Company agreed to provide certain transition services to Cole Haan for an expected period of 3 to 9 months from the date of sale. The Company will also license NIKE proprietary Air and Lunar technologies to Cole Haan for a transition period. The continuing cash flows related to these items are not expected to be significant to Cole Haan and the Company will have no significant continuing involvement with Cole Haan beyond the transition services. Additionally, preexisting guarantees of certain Cole Haan lease payments remain in place after the sale; the maximum exposure under the guarantees is \$44 million at May 31, 2013. The fair value of the guarantees is not material.

On November 30, 2012, the Company completed the sale of certain assets of Umbro to Iconix Brand Group ("Iconix") for \$225 million. The Umbro disposal group was classified as held-for-sale as of November 30, 2012 and the results of Umbro's operations are presented in the net income (loss) from discontinued operations line item on the consolidated statements of income. The remaining liabilities of Umbro are recorded in the liabilities of discontinued operations line items on the consolidated balance sheets. Previously, these amounts were reported in the Company's segment presentation as "Other Businesses." Upon meeting the held-for-sale criteria, the Company recorded a loss of \$107 million, net of tax, on the sale of Umbro and the loss is included in the net income (loss) from discontinued operations line item on the consolidated statements of income. The loss on sale was calculated as the net sales price less Umbro assets of \$248 million, including intangibles, goodwill, and fixed assets, other miscellaneous charges of \$22 million, and the release of the associated cumulative translation adjustment of \$129 million. The tax benefit on the loss was \$67 million. There were no adjustments to these recorded amounts as of May 31, 2013.

Under the sale agreement, the Company provided transition services to Iconix while certain markets were transitioned to Iconix-designated licensees. These transition services are complete and the Company has wound down the remaining operations of Umbro.

For the year ended May 31, 2013, net income (loss) from discontinued operations included, for both businesses, the net gain or loss on sale, net operating losses, tax expenses, and approximately \$20 million in wind down costs.

Summarized results of the Company's discontinued operations are as follows:

	Year Ended May 31,									
(In millions)		2013		2012	2011					
Revenues	\$	523	\$	796 \$	746					
Income (loss) before income taxes		108		(43)	(18)					
Income tax expense (benefit)		87		3	21					
Net income (loss) from discontinued operations	\$	21	\$	(46) \$	(39)					

As of May 31, 2013 and 2012, the aggregate components of assets and liabilities classified as discontinued operations and included in current assets and current liabilities consisted of the following:

	As of May 31,							
(In millions)		2013		2012				
Accounts Receivable, net	\$	_	\$	148				
Inventories		_		128				
Deferred income taxes and other assets		_		35				
Property, plant and equipment, net		_		70				
Identifiable intangible assets, net		_		234				
TOTAL ASSETS	\$	_	\$	615				
Accounts payable	\$	1	\$	42				
Accrued liabilities		17		112				
Deferred income taxes and other liabilities		_		16				
TOTALLIABILITIES	\$	18	\$	170				

#### NOTE 16 — Commitments and Contingencies

The Company leases space for certain of its offices, warehouses and retail stores under leases expiring from 1 to 21 years after May 31, 2013. Rent expense was \$482 million, \$431 million, and \$386 million for the years ended May 31, 2013, 2012 and 2011, respectively. Amounts of minimum future annual rental commitments under non-cancelable operating leases in each of the five years ending May 31, 2014 through 2018 are \$403 million, \$340 million, \$304 million, \$272 million, \$225 million, respectively, and \$816 million in later years. Amounts of minimum future annual commitments under non-cancelable capital leases in each of the four years ending May 31, 2014 through 2017 are \$23 million, \$28 million, \$21 million, and \$9 million, respectively; the Company has no capital lease obligations beyond the year ending May 31, 2017.

As of May 31, 2013 and 2012, the Company had letters of credit outstanding totaling \$149 million and \$137 million, respectively. These letters of credit were generally issued for the purchase of inventory and guarantees of the Company's performance under certain self-insurance and other programs.

In connection with various contracts and agreements, the Company provides routine indemnifications relating to the enforceability of intellectual property rights, coverage for legal issues that arise and other items where the Company is acting as the guarantor. Currently, the Company has several such agreements in place. However, based on the Company's historical experience and the estimated probability of future loss, the Company has determined that the fair value of such indemnifications is not material to the Company's financial position or results of operations.

In the ordinary course of its business, the Company is involved in various legal proceedings involving contractual and employment relationships, product liability claims, trademark rights, and a variety of other matters. While the Company cannot predict the outcome of its pending legal matters

with certainty, the Company does not believe any currently identified claim, proceeding or litigation, either individually or in aggregate, will have a material impact on the Company's results of operations, financial position or cash flows.

#### NOTE 17 — Risk Management and Derivatives

The Company is exposed to global market risks, including the effect of changes in foreign currency exchange rates and interest rates, and uses derivatives to manage financial exposures that occur in the normal course of business. The Company does not hold or issue derivatives for trading or speculative purposes.

The Company may elect to designate certain derivatives as hedging instruments under the accounting standards for derivatives and hedging. The Company formally documents all relationships between designated hedging instruments and hedged items as well as its risk management objective and strategy for undertaking hedge transactions. This process includes linking all derivatives designated as hedges to either recognized assets or liabilities or forecasted transactions.

The majority of derivatives outstanding as of May 31, 2013 are designated as cash flow or fair value hedges. All derivatives are recognized on the balance sheet at fair value and classified based on the instrument's maturity date. The total notional amount of outstanding derivatives as of May 31, 2013 was approximately \$9 billion, which primarily comprises cash flow hedges for Euro/U.S. Dollar, British Pound/Euro, and Japanese Yen/U.S. Dollar currency pairs. As of May 31, 2013, there were outstanding currency forward contracts with maturities up to 24 months.

The following table presents the fair values of derivative instruments included within the consolidated balance sheets as of May 31, 2013 and 2012:

	Asse	t Deri	vatives	;		Liability	Derivatives				
(In millions)	Balance Sheet Location		2013 2012		12	Balance Sheet Location	2013		20	12	
Derivatives formally designated as hedging instruments:											
Foreign exchange forwards and options	Prepaid expenses and other current assets	\$	141	\$	203	Accrued liabilities	\$	12	\$	35	
Foreign exchange forwards and options	Deferred income taxes and other long-term assets		79		7	Deferred income taxes and other long-term liabilities		_		_	
Interest rate swap contracts	Deferred income taxes and other long-term assets		11		15	Deferred income taxes and other long-term liabilities		_			
Total derivatives formally designated as hedging instrume	ents	\$	231	\$	225		\$	12	\$	35	
Derivatives not designated as hedging instruments:											
Foreign exchange forwards and options	Prepaid expenses and other current assets	\$	58	\$	55	Accrued liabilities	\$	22	\$	20	
Embedded derivatives	Prepaid expenses and other current assets		_		1	Accrued liabilities		_		_	
Total derivatives not designated hedging instruments	as		58		56			22		20	
TOTAL DERIVATIVES		\$	289	\$	281		\$	34	\$	55	

The following tables present the amounts affecting the consolidated statements of income for years ended May 31, 2013, 2012 and 2011:

Amount of Gain (Loce)

	F	Recog mpre	niz hei	ed in esive ivative	Òtl Inc	ner [°] ome	Amount of Gain (Loss)  Reclassified From Accumulated Other Comprehensive Income into Income						
	١	Year Ended May 31,			ay :	31,	Location of Gain (Loss) Reclassified From Accumulated	Year Ended May 3					
(In millions)	20	013	2	012	2	013	Other Comprehensive Income Into Income ⁽¹⁾		13	2012		2013	
Derivatives designated as cash flow hedges:													
Foreign exchange forwards and options	\$	42	\$	(29)	\$	(87)	Revenue	\$	(19)	\$	5 \$	\$ (30)	
Foreign exchange forwards and options		67		253		(152)	Cost of sales		113		(57)	103	
Foreign exchange forwards and options		(3)		3		(4)	Selling and administrative expense		2		(2)	2) 1	
Foreign exchange forwards and options		33		36		(65)	Other (income) expense, net		9		(9)	34	
Total designated cash flow hedges	\$	139	\$	263	\$	(308)		\$	105	\$	(63) \$	108	
Derivatives designated as net investment hedges:													
Foreign exchange forwards and options	\$	_	\$	45	\$	(85)	Other (income) expense, net	\$	_	\$	— \$	<u> </u>	

⁽¹⁾ For the years ended May 31, 2013, 2012, and 2011, the amounts recorded in other (income) expense, net as a result of hedge ineffectiveness and the discontinuance of cash flow hedges because the forecasted transactions were no longer probable of occurring were immaterial.

	Amou		Gain (Lo me on D		Location of Gain (Loss)	
		Year E	nded Ma	ay 31	Recognized in Income	
(In millions)	201	13	2012		2011	on Derivatives
Derivatives designated as fair value hedges:						
Interest rate swaps ⁽¹⁾	\$	5	\$	6	\$ 6	Interest (income) expense, net
Derivatives not designated as hedging instruments:						
Foreign exchange forwards and options		51		64	(30)	Other (income) expense, net
Embedded derivatives	\$	(4)	\$	1	\$ _	Other (income) expense, net

⁽¹⁾ All interest rate swap agreements meet the shortcut method requirements under the accounting standards for derivatives and hedging. Accordingly, changes in the fair values of the interest rate swap agreements are considered to exactly offset changes in the fair value of the underlying long-term debt. Refer to "Fair Value Hedges" in this note for additional detail.

Refer to Note 5 — Accrued Liabilities for derivative instruments recorded in accrued liabilities, Note 6 — Fair Value Measurements for a description of how the above financial instruments are valued, Note 14 — Accumulated Other Comprehensive Income and the consolidated statements of shareholders' equity for additional information on changes in other comprehensive income for the years ended May 31, 2013, 2012 and 2011.

#### **Cash Flow Hedges**

The purpose of the Company's foreign currency hedging activities is to protect the Company from the risk that the eventual cash flows resulting from transactions in foreign currencies will be adversely affected by changes in exchange rates. Foreign currency exposures that the Company may elect to hedge in this manner include product cost exposures, non-functional currency denominated external and intercompany revenues, selling and administrative expenses, investments in U.S. Dollar-denominated available- for-sale debt securities and certain other intercompany transactions.

Product cost exposures are primarily generated through non-functional currency denominated product purchases and the foreign currency adjustment program described below. NIKE entities primarily purchase products in two ways: (1) Certain NIKE entities purchase product from the NIKE Trading Company ("NTC"), a wholly-owned sourcing hub that buys NIKE branded products from third party factories, predominantly in U.S. Dollars. The NTC, whose functional currency is the U.S. Dollar, then sells the products to NIKE entities in their respective functional currencies. When the NTC sells to a NIKE entity with a different functional currency, the result is a foreign currency exposure for the NTC; (2) Other NIKE entities purchase product directly from third party factories in U.S. Dollars. These purchases generate a foreign currency exposure for those NIKE entities with a functional currency other than the U.S. Dollar.

In January 2012, the Company implemented a foreign currency adjustment program with certain factories. The program is designed to more effectively manage foreign currency risk by assuming certain of the factories' foreign currency exposures, some of which are natural offsets to our existing foreign currency exposures. Under this program, the Company's payments to these factories are adjusted for rate fluctuations in the basket of currencies ("factory currency exposure index") in which the labor, materials and overhead costs incurred by the factories in the production of NIKE branded products ("factory input costs") are denominated. For the portion of the indices denominated in the local or functional currency of the factory, the Company may elect to place formally designated cash flow hedges. For all currencies within the indices, excluding the U.S. Dollar and the local or functional currency of the factory, an embedded derivative contract is created upon the factory's acceptance of NIKE's purchase order. Embedded derivative contracts are separated from the related purchase order and their accounting treatment is described further below.

The Company's policy permits the utilization of derivatives to reduce its foreign currency exposures where internal netting or other strategies cannot be effectively employed. Hedged transactions are denominated primarily in Euros, British Pounds and Japanese Yen. The Company may enter into hedge contracts typically starting up to 12 to 18 months in advance of the forecasted transaction and may place incremental hedges for up to 100% of the exposure by the time the forecasted transaction occurs.

All changes in fair value of derivatives designated as cash flow hedges, excluding any ineffective portion, are recorded in other comprehensive income until net income is affected by the variability of cash flows of the hedged transaction. In most cases, amounts recorded in other comprehensive income will be released to net income some time after the maturity of the related derivative. Effective hedge results are classified within the consolidated statements of income in the same manner as the underlying exposure, with the results of hedges of non-functional currency denominated revenues and product cost exposures, excluding embedded derivatives as described below, recorded in revenues or cost of sales, when the underlying hedged transaction affects consolidated net income. Results of hedges of selling and administrative expense are recorded together with those costs when the related expense is recorded. Results of hedges of anticipated purchases and sales of U.S. Dollar-denominated available-for-sale securities are recorded in other (income) expense, net when the securities are sold. Results of hedges of certain anticipated intercompany transactions are recorded in other (income) expense, net when the transaction occurs. The Company classifies the cash flows at settlement from these designated cash flow hedge derivatives in the same category as the cash flows from the related hedged items, generally within the cash provided by operations component of the cash flow statement.

Premiums paid on options are initially recorded as deferred charges. The Company assesses the effectiveness of options based on the total cash flows method and records total changes in the options' fair value to other comprehensive income to the degree they are effective.

The Company formally assesses, both at a hedge's inception and on an ongoing basis, whether the derivatives that are used in the hedging transaction have been highly effective in offsetting changes in the cash flows of hedged items and whether those derivatives may be expected to remain highly effective in future periods. Effectiveness for cash flow hedges is assessed based on forward rates. Ineffectiveness was not material for the years ended May 31, 2013, 2012 and 2011.

The Company discontinues hedge accounting prospectively when (1) it determines that the derivative is no longer highly effective in offsetting changes in the cash flows of a hedged item (including hedged items such as firm commitments or forecasted transactions); (2) the derivative expires or is sold, terminated, or exercised; (3) it is no longer probable that the forecasted transaction will occur; or (4) management determines that designating the derivative as a hedging instrument is no longer appropriate.

When the Company discontinues hedge accounting because it is no longer probable that the forecasted transaction will occur in the originally expected period, but is expected to occur within an additional two-month period of time thereafter, the gain or loss on the derivative remains in accumulated other comprehensive income and is reclassified to net income when the forecasted transaction affects consolidated net income. However, if it is probable that a forecasted transaction will not occur by the end of the originally specified time period or within an additional two-month period of time thereafter, the gains and losses that were accumulated in other comprehensive income will be recognized immediately in other (income) expense, net. In all situations in which hedge accounting is discontinued and the derivative remains outstanding, the Company will carry the derivative at its fair value on the balance sheet, recognizing future changes in the fair value in other (income) expense, net. For the years ended May 31, 2013, 2012 and 2011, the amounts recorded in other (income) expense, net as a result of the discontinuance of cash flow hedging because the forecasted transaction was no longer probable of occurring were immaterial.

As of May 31, 2013, \$132 million of deferred net gains (net of tax) on both outstanding and matured derivatives accumulated in other comprehensive income are expected to be reclassified to net income during the next 12 months concurrent with the underlying hedged transactions also being recorded in net income. Actual amounts ultimately reclassified to net income are dependent on the exchange rates in effect when derivative contracts that are currently outstanding mature. As of May 31, 2013, the maximum term over which the Company is hedging exposures to the variability of cash flows for its forecasted transactions is 24 months.

#### Fair Value Hedges

The Company is also exposed to the risk of changes in the fair value of certain fixed-rate debt attributable to changes in interest rates. Derivatives currently used by the Company to hedge this risk are receive-fixed, pay-variable interest rate swaps. As of May 31, 2013, all interest rate swap agreements are designated as fair value hedges of the related long-term debt and meet the shortcut method requirements under the accounting standards for derivatives and hedging. Accordingly, changes in the fair values of the interest rate swap agreements are considered to exactly offset changes in the fair value of the underlying long-term debt. The cash flows associated with the Company's fair value hedges are periodic interest payments while the swaps are outstanding, which are reflected within the cash provided by operations component of the cash flow statement. The Company recorded no ineffectiveness from its interest rate swaps designated as fair value hedges for the years ended May 31, 2013, 2012, or 2011.

#### **Net Investment Hedges**

The Company has hedged and may, in the future, hedge the risk of variability in foreign-currency-denominated net investments in wholly-owned international operations. All changes in fair value of the derivatives designated as net investment hedges, except ineffective portions, are reported in the cumulative translation adjustment component of other comprehensive income along with the foreign currency translation adjustments on those investments. The Company classifies the cash flows at settlement of its net investment hedges within the cash provided or used by investing component of the cash flow statement. The Company assesses hedge effectiveness based on changes in forward rates. The Company recorded no ineffectiveness from its net investment hedges for the years ended May 31, 2013, 2012, or 2011.

#### **Embedded Derivatives**

As part of the foreign currency adjustment program described above, currencies within the factory currency exposure indices that are neither the Dollar nor the local or functional currency of the factory, an embedded derivative contract is created upon the factory's acceptance of NIKE's purchase order. Embedded derivative contracts are treated as foreign currency forward contracts that are bifurcated from the related purchase order and recorded at fair value as a derivative asset or liability on the balance sheet with their corresponding change in fair value recognized in other (income) expense, net from the date a purchase order is accepted by a factory through the date the purchase price is no longer subject to foreign currency fluctuations. At May 31, 2013, the notional amount of embedded derivatives was approximately \$136 million.

#### **Undesignated Derivative Instruments**

The Company may elect to enter into foreign exchange forwards to mitigate the change in fair value of specific assets and liabilities on the balance sheet and/or the embedded derivative contracts explained above. These forwards are not designated as hedging instruments under the accounting standards for derivatives and hedging. Accordingly, these undesignated instruments are recorded at fair value as a derivative asset or liability on the balance sheet with their corresponding change in fair value recognized in other (income) expense, net, together with the remeasurement gain or loss from the hedged balance sheet position or embedded derivative contract. The Company classifies the cash flows at settlement from undesignated instruments in the same category as the cash flows from the related hedged items, generally within the cash provided by operations component of the cash flow statement.

#### Credit Risk

The Company is exposed to credit-related losses in the event of non- performance by counterparties to hedging instruments. The counterparties to all derivative transactions are major financial institutions with investment grade credit ratings. However, this does not eliminate the Company's exposure to credit risk with these institutions. This credit risk is limited to the unrealized gains in such contracts should any of these counterparties fail to perform as contracted. To manage this risk, the Company has established strict counterparty credit guidelines that are continually monitored.

The Company's derivative contracts contain credit risk related contingent features designed to protect against significant deterioration in counterparties' creditworthiness and their ultimate ability to settle outstanding derivative contracts in the normal course of business. The Company's bilateral credit related contingent features generally require the owing entity, either the Company or the derivative counterparty, to post collateral for the portion of the fair value in excess of \$50 million should the fair value of outstanding derivatives per counterparty be greater than \$50 million. Additionally, a certain level of decline in credit rating of either the Company or the counterparty could also trigger collateral requirements. As of May 31, 2013, the Company was in compliance with all credit risk related contingent features and the fair value of its derivative instruments with credit risk related contingent features in a net liability position was insignificant. Accordingly, the Company was not required to post any collateral as a result of these contingent features. Further, as of May 31, 2013 those counterparties which were required to post collateral complied with such requirements. Given the considerations described above, the Company considers the impact of the risk of counterparty default to be immaterial.

#### NOTE 18 — Operating Segments and Related Information

Operating Segments. The Company's operating segments are evidence of the structure of the Company's internal organization. The major segments are defined by geographic regions for operations participating in NIKE Brand sales activity excluding NIKE Golf. Each NIKE Brand geographic segment operates predominantly in one industry: the design, development, marketing and selling of athletic footwear, apparel, and equipment. The Company's reportable operating segments for the NIKE Brand are: North America, Western Europe, Central & Eastern Europe, Greater China, Japan, and Emerging Markets. The Company's NIKE Brand Direct to Consumer operations are managed within each geographic segment.

The Company's "Other" category is broken into two components for presentation purposes to align with the way management views the Company. The "Global Brand Divisions" category primarily represents NIKE Brand licensing businesses that are not part of a geographic operating segment, demand creation and operating overhead expenses that are centrally managed for the NIKE Brand, and costs associated with product development and supply chain operations. The "Other Businesses" category consists of the activities of Converse Inc., Hurley International LLC, and NIKE Golf. Activities represented in the "Other" category are considered immaterial for individual disclosure.

Corporate consists largely of unallocated general and administrative expenses, including expenses associated with centrally managed departments, depreciation and amortization related to the Company's headquarters, unallocated insurance and benefit programs, including stock- based compensation, certain foreign currency gains and losses, including certain hedge gains and losses, certain corporate eliminations and other items.

The primary financial measure used by the Company to evaluate performance of individual operating segments is earnings before interest and taxes (commonly referred to as "EBIT"), which represents net income before interest (income) expense, net and income taxes in the consolidated statements of income. Reconciling items for EBIT represent corporate expense items that are not allocated to the operating segments for management reporting.

As part of our centrally managed foreign exchange risk management program, standard foreign currency rates are assigned twice per year to each NIKE Brand entity in our geographic operating segments and certain Other Businesses. These rates are set approximately nine months in advance of the future selling season based on average market spot rates in the calendar month preceding the date they are established. Inventories and cost of sales for geographic operating segments and certain Other Businesses reflect use of these standard rates to record non-functional currency product purchases in the entity's functional currency. Differences between assigned standard foreign currency rates and actual market rates are included in Corporate, together with foreign currency hedge gains and losses generated from our centrally managed foreign exchange risk management program and other conversion gains and losses.

Accounts receivable, inventories and property, plant and equipment for operating segments are regularly reviewed by management and are therefore provided below. Additions to long-lived assets as presented in the following table represent capital expenditures.

Certain prior year amounts have been reclassified to conform to fiscal 2013 presentation.

			ear/	Ended May 31	,	
(In millions)		2013		2012		2011
REVENUE						
North America	\$	10,387	\$	8,839	\$	7,579
Western Europe		4,128		4,144		3,868
Central & Eastern Europe		1,287		1,200		1,040
Greater China		2,453		2,539		2,060
Japan		791		835		773
Emerging Markets		3,718		3,411		2,737
Global Brand Divisions		117		111		96
Total NIKE Brand		22,881		21,079		18,153
Other Businesses		2,500		2,298		2,041
Corporate		(68)		(46)		(77)
TOTAL NIKE CONSOLIDATED REVENUES	\$	25,313	\$	23,331		20,117
EARNINGS BEFORE INTEREST AND TAXES		-,-	<u> </u>	-,	<u> </u>	
North America	\$	2,534	\$	2,030	\$	1,736
Western Europe	•	640	<u> </u>	597	Ψ	730
Central & Eastern Europe		259		234		244
Greater China		809		911		777
Japan		133		136		114
Emerging Markets		1,011		853		688
Global Brand Divisions		(1,396)				
Total NIKE Brand				(1,200)		(971)
		3,990 456		3,561 385		3,318 353
Other Businesses						
Corporate  This INVESTIGATION OF THE PROPERTY		(1,177)		(917)		(805)
Total NIKE Consolidated Earnings Before Interest and Taxes		3,269		3,029		2,866
Interest (income) expense, net	•	(3)		4		4
TOTAL NIKE CONSOLIDATED EARNINGS BEFORE TAXES	\$	3,272	\$	3,025	Þ	2,862
ADDITIONS TO LONG-LIVED ASSETS	•	004	•	404	•	70
North America	\$	201	\$	131	\$	79
Western Europe		74		93		75
Central & Eastern Europe		22		20		5
Greater China		52		38		43
Japan		6		14		9
Emerging Markets		49		27		21
Global Brand Divisions		216		131		44
Total NIKE Brand		620		454		276
Other Businesses		29		24		27
Corporate		131		109		118
TOTAL ADDITIONS TO LONG-LIVED ASSETS	\$	780	\$	587	\$	421
DEPRECIATION						
North America	\$	85	\$	78	\$	70
Western Europe		68		62		52
Central & Eastern Europe		9		6		4
Greater China		34		25		19
Japan		21		23		22
Emerging Markets		20		15		14
Global Brand Divisions		83		53		39
Total NIKE Brand		320		262		220
Other Businesses		24		25		24
Corporate		74		66		71
TOTAL DEPRECIATION	\$	418	\$	353	\$	315
	Ψ	710	Ψ		<u> </u>	0.10

	As of May 31,			
(In millions)		2013		2012
ACCOUNTS RECEIVABLE, NET				
North America	\$	1,214	\$	1,149
Western Europe		356		420
Central & Eastern Europe		301		261
Greater China		52		221
Japan		133		152
Emerging Markets		546		476
Global Brand Divisions		28		30
Total NIKE Brand		2,630		2,709
Other Businesses		436		401
Corporate		51		22
TOTAL ACCOUNTS RECEIVABLE, NET	\$	3,117	\$	3,132
INVENTORIES				
North America	\$	1,435	\$	1,272
Western Europe		539		488
Central & Eastern Europe		207		180
Greater China		204		217
Japan		60		83
Emerging Markets		555		521
Global Brand Divisions		32		35
Total NIKE Brand		3,032		2,796
Other Businesses		400		384
Corporate		2		42
TOTAL INVENTORIES	\$	3,434	\$	3,222
PROPERTY, PLANT AND EQUIPMENT, NET				
North America	\$	406	\$	378
Western Europe		326		314
Central & Eastern Europe		44		30
Greater China		213		191
Japan		269		359
Emerging Markets		89		59
Global Brand Divisions		353		205
Total NIKE Brand		1,700		1,536
Other Businesses		77		76
Corporate		675		597
TOTAL PROPERTY, PLANT AND EQUIPMENT, NET	\$	2,452	\$	2,209

Revenues by Major Product Lines. Revenues to external customers for NIKE Brand products are attributable to sales of footwear, apparel and equipment. Other revenues to external customers primarily include external sales by Converse, Hurley, and NIKE Golf.

	Year Ended May 31,					
(In millions)		2013		2012		2011
Footwear	\$	14,539	\$	13,428	\$	11,519
Apparel		6,820		6,336		5,516
Equipment		1,405		1,204		1,022
Other		2,549		2,363		2,060
TOTAL NIKE CONSOLIDATED REVENUES	\$	25,313	\$	23,331	\$	20,117

## Appendix C

## **International Financial Reporting Standards (IFRS)**

### IFRS

### **The Need for Global Accounting Standards**

As discussed in Chapter 1, the Financial Accounting Standards Board (FASB) establishes generally accepted accounting principles (GAAP) for public companies in the United States. Of course, there is a world beyond the borders of the United States. In recent years, the removal of trade barriers and the growth in cross-border equity and debt issuances have led to a dramatic increase in international commerce. As a result, often companies are reporting financial results to users outside of the United States.

Historically, accounting standards have varied considerably across countries. These variances have been driven by cultural, legal, and political differences and resulted in financial statements that were not easily comparable and difficult to interpret. These differences caused problems for companies in Europe and Asia, where local economies have become increasingly tied to international commerce.

During the last decade, however, a common set of International Financial Reporting Standards (IFRS) has emerged to reduce cross-country differences in accounting standards, primarily in countries outside of North America. While much of the world has migrated to IFRS, the United States has not. Because of the size of the United States and its significant role in world commerce, U.S. GAAP still has a global impact. As a result, there are currently two major accounting standard-setting efforts in the world, U.S. GAAP and IFRS. These two sets of accounting standards add cost and complexity for companies doing business and obtaining financing internationally.

#### Overview of IFRS

International Financial Reporting Standards have emerged during the last 10 years to meet the financial reporting needs of an increasingly global business environment.

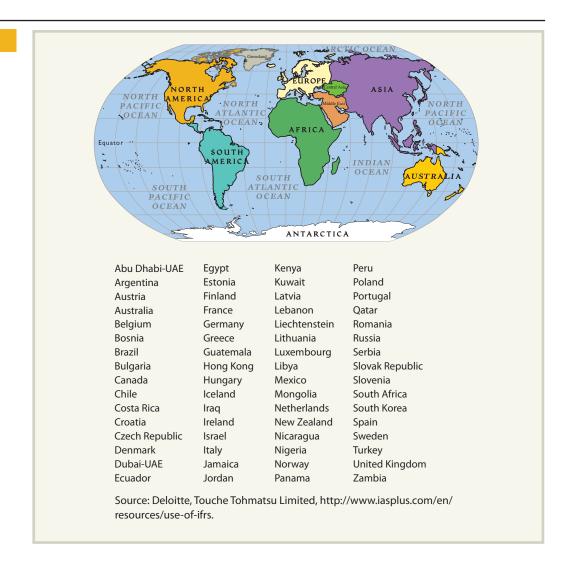
What Is IFRS? International Financial Reporting Standards are a set of global accounting standards developed by an international standard-setting body called the International Accounting Standards Board (IASB). Like the Financial Accounting Standards Board, the IASB is an independent entity that establishes accounting rules. Unlike the FASB, the IASB does not establish accounting rules for any specific country. Rather, it develops accounting rules that can be used by a variety of countries, with the goal of developing a single set of global accounting standards.

Who Uses IFRS? IFRS applies to companies that issue publicly traded debt or equity securities, called **public companies**, in countries that have adopted IFRS as their

accounting standards. Since 2005, all 28 countries in the European Union (EU) have been required to prepare financial statements using IFRS. In addition, more than 100 other countries have adopted IFRS for public companies (see Exhibit 1). In other major economies, Japan is considering mandatory adoption by 2016, India allows limited use of IFRS, and China is converging its standards with IFRS over time. In addition, the G20 (Group of 20) leadership has called for uniform global accounting standards.

#### **EXHIBIT 1**

**IFRS Adopters** 



#### U.S. GAAP and IFRS: The Road Forward

The United States has not formally adopted IFRS for U.S. companies. The wide acceptance being gained by IFRS around the world, however, has placed considerable pressure on the United States to align U.S. GAAP with IFRS. There are two possible paths that the United States could take to achieve this: (1) adoption of IFRS by the U.S. Securities and Exchange Commission or (2) convergence of U.S. GAAP and IFRS. These two options are briefly discussed in this section.

**Adoption of IFRS by the SEC** The U.S. Securities and Exchange Commission (SEC) is the U.S. governmental agency that has authority over the accounting and financial disclosures for U.S. public companies. Only the SEC has the authority to adopt IFRS for U.S. public companies. After considerable deliberation over a period of nearly five years, the SEC published a Final Report on the issues surrounding IFRS

adoption.¹ Notably, this report did not include a final policy decision or recommendation in favor of U.S. public companies adopting IFRS. Indeed, since this report, the SEC has distanced itself from the adoption position, and it is now acknowledged as unsupported. This leaves what remains of the convergence pathway.

Convergence of U.S. GAAP and IFRS Convergence involves aligning IFRS and U.S. GAAP one topic at a time, by slowly merging IFRS and U.S. GAAP into two broadly uniform sets of accounting standards. To this end, the FASB and IASB have agreed to work together on a select number of difficult and high-profile accounting issues. These issues frame a large portion of the disagreement between the two sets of standards and, if accomplished, will significantly reduce the differences between U.S. GAAP and IFRS. The projects selected for the convergence effort represent some of the more technical topics in accounting and are covered in intermediate and advanced accounting courses. As of 2013, there remain a small number of topics as part of the formal convergence effort between the FASB and IASB. Once these topics have been completed, the formal joint convergence effort will end. It is unclear how convergence between the two boards will proceed after these topics are converged.

One of the major limitations of convergence is that both the FASB and IASB continue to operate as the accounting standard-setting bodies for their respective jurisdictions. As such, convergence would not result in a single set of global accounting standards. Only those standards that go through the joint FASB-IASB standard-setting process would be released as uniform. Standards that do not go through a joint standard-setting process may create inconsistencies between U.S. GAAP and IFRS. Thus, convergence does not guarantee complete uniformity between U.S. GAAP and IFRS. Thus, there will remain differences in U.S. GAAP and IFRS in the foreseeable future. Understanding these differences are important because of increased globalization of business.

#### **Differences Between U.S. GAAP and IFRS**

U.S. GAAP and IFRS differ both in their approach to standard setting, as well as their financial statement presentation and recording of transactions.

Rules-Based Versus Principles Approach to Standard Setting U.S. GAAP is considered to be a "rules-based" approach to accounting standard setting. The accounting standards provide detailed and specific rules on the accounting for business transactions. There are few exceptions or varying interpretations of the accounting for a business event. This structure is consistent with the U.S. legal and regulatory system, reflecting the social and economic values of the United States.

In contrast, IFRS is designed to meet the needs of many countries. Differences in legal, political, and economic systems create different needs for and uses of financial information in different countries. For example, Germany needs a financial reporting system that reflects the central role of banks in its financial system, while the Netherlands needs a financial reporting system that reflects the significant role of outside equity in its financial system.

To accommodate economic, legal, and social diversity, IFRS must be broad enough to capture these differences while still presenting comparable financial statements. Under IFRS, there is greater opportunity for different interpretations of the accounting treatment of a business event across different business entities. To support this, IFRS often has more extensive disclosures that support alternative assumptions. Thus, IFRS provides more latitude for professional judgment than typically found in comparable U.S. GAAP. Many countries find this feature attractive in reducing regulatory costs associated with using and auditing financial reports. This "principles-based" approach presents one of the most significant challenges to adopting IFRS in the United States.

¹Work Plan for the Consideration of Incorporating International Financial Accounting Standards into the Financial Reporting System for U.S. Issuers: Final Staff Report, U.S. Securities Exchange Commission, July 13, 2012.

**Technical Differences Between IFRS and U.S. GAAP** Although U.S. GAAP is similar to IFRS, differences arise in the presentation format, balance sheet valuations, and technical accounting procedures. The Mornin' Joe International financial statements presented after Chapter 13 highlight the financial statement format, presentation, and recording differences between U.S. GAAP and IFRS. In addition, the International Connection boxes in Chapters 1, 4, 6, 9, 11, and 14 discuss some of the significant differences between U.S. GAAP and IFRS. A more comprehensive summary of the key differences between U.S. GAAP and IFRS that are relevant to an introductory accounting course is provided in Exhibit 2.

## **Discussion Questions**

- 1. Briefly discuss why global accounting standards are needed in today's business environment.
- 2. What are International Financial Reporting Standards? Who uses these accounting standards?
- 3. What body is responsible for setting International Financial Reporting Standards?
- 4. Briefly discuss the differences between (a) adoption of IFRS by the U.S. Securities and Exchange Commission and (b) convergence of U.S. GAAP with IFRS.
- 5. Briefly discuss the difference between (a) a "rulesbased" approach to accounting standard setting and (b) a "principles-based" approach to accounting standard setting.
- 6. How is property, plant, and equipment measured on the balance sheet under IFRS? How does this differ from the way property, plant, and equipment is measured on the balance sheet under U.S. GAAP?
- 7. What inventory costing methods are allowed under IFRS? How does this differ from the treatment under U.S. GAAP?

General: Financial statement titles Financial periods presented Financial periods presented Comparative in statement of sof cash flows Conceptual basis for standard Setting Internal control requirements  Balance Sheet:  Townisology difference  Balance Sheet:  "Description of the standard setting and and the standard setting and the standard set			
presented for standard equirements	ААР	IFRS	Text Refe
presented for standard equirements			
for standard equirements	Balance Sheet Statement of Stockholders' Equity Statement of Cash Flows	Statement of Financial Position Statement of Changes in Equity Statement of Cash Flows	General
for standard equirements	Public companies must present two years of comparative information for income statement, statement of stockholders' equity, and statement of cash flows	One year of comparative information must be presented	General
equirements	"Rules-based" approach	"Principles-based" approach	General
SOLUCIO	Sarbanes-Oxley Act (SOX) Section 404		Ch 7; LO 1
	Balance Sheet	Statement of Financial Position	
	"Payable" "Stockholders' Equity" "Net Income (Loss)"	"Provision" "Capital and Reserves" "Profit or (Loss)"	Ch 10 Ch 11 General
Inventory—LIFO LIFO	llowed	LIFO prohibited	Ch 6; LO 3,
Inventory—valuation Market is de Reversal of I not allowed	Market is defined as "replacement value" Reversal of lower-of-cost-or-market write-downs not allowed	Market is defined as "fair value" Reversal of write-downs allowed	Ch 6; LO 6 Ch 6; LO 6
Long-lived assets May NO	May NOT be revalued to fair value	May be revalued to fair value on a regular basis	Ch 9; LO 1

EXHIBIT 2 Comp	Comparison of Accounting for Selected Items Under U.S. GAAP and IFRS (Continued)	GAAP and IFRS (Continued)	
	U.S. GAAP	IFRS	Text Reference
Land held for investment	Treated as held for use or sale, and recorded at historical cost	May be accounted for on a historical cost basis or on a fair value basis with changes in fair value recognized through profit and loss	Ch 9; LO 1
Property, plant, & equipment—valuation	Historical cost  If impaired, impairment loss may NOT be reversed in future periods	May select between historical cost or revalued amount (a form of fair value) If impaired, impairment loss may be reversed in future periods	Ch 9; LO 1
Cost of major overhaul (Capital and revenue expenditures)	Different treatment for ordinary repairs and maintenance, asset improvement, extraordinary repairs	Typically included as part of the cost of the asset or asset component if future economic benefit is probable and can be reliably measured	Ch 9; LO 1
Intangible assets—valuation	Acquisition cost, unless impaired	Fair value permitted if the intangible asset trades in an active market	Ch 9; LO 5
Intangible assets—impairment loss reversal	Prohibited	Prohibited for goodwill but allowed for other intangible assets	Ch 9; LO 5
Deferred tax liability	The amount due within one year classified as current	Always noncurrent	Appendix C
Income Statement:	Income Statement	Statement of Comprehensive Income	
Revenue recognition	Detailed guidance depending on the transaction	Broad guidance	Ch 3; LO 1
Classification of expenses on income statement	Public companies must present expenses on the income statement by function (e.g., cost of goods sold, selling, administrative)	Expenses may be presented based either by function (e.g., cost of goods sold, selling) or by the nature of expense (e.g., wages expense, interest expense)	Ch 5; LO 1
Research and development costs	Expensed as incurred	Research costs expensed Development costs capitalized once technical and economic feasibility attained	Ch 9; LO 5
Extraordinary items	Allowed for items that are both unusual in nature and infrequent in occurrence	Prohibited	Ch 15; Appendix

EXHIBIT 2	Comparison of Accounting for Selected Items Under U	for Selected Items Under U.S. GAAP and IFRS (Concluded)	
	U.S. GAAP	IFRS	Text Reference
Statement of Cash Flows:	Statement of Cash Flows	Statement of Cash Flows	
Classification of interest paid or received	Treated as an operating activity	Interest paid may be treated as either an operating or a financing activity; interest received may be treated as an operating or investing activity	Ch 14; LO 3
Classification of dividend paid or received	Dividend paid treated as a financing activity, dividend received treated as an operating activity	Dividend paid may be treated as either an operating or a financing activity; dividend received may be treated as an operating or investing activity	Ch 14; LO 3

## Appendix D

### **Revenue Recognition**

Companies recognize revenue when services have been performed or products have been delivered to customers. For example, when McDonald's sells a hamburger, the revenue is earned when the hamburger is delivered to the customer. In this example, revenue recognition is simple because the hamburger is delivered and cash is received at a single point in time.

Revenue recognition is more complex, however, when a transaction includes several items that are sold together, items that are delivered over time, or items whose prices depend upon future events. To address these more complex transactions, the Financial Accounting Standards Board (FASB) issued a new accounting standard in May 2014. The new Standard uses a five-step method for determining when revenue should be recognized. The five steps are as follows:

- Step 1. Identify the contract with the customer. The new Standard treats every revenue transaction as a contract. A contract is an agreement by the seller to provide a good or service in exchange for payment from the buyer. A contract may be verbal and implicit, such as the purchase of a McDonald's hamburger, or written and explicit, such as a cell phone contract.
- Step 2. *Identify the separate performance obligations in the contract*. Every contract requires the seller and buyer to perform. For example, when you purchase a McDonald's hamburger, you (the buyer) perform by paying and McDonald's (the seller) performs by delivering a hamburger. When you purchase a cell phone from Verizon, the transaction is more complex. You perform by paying cash or charging your credit card and signing a written contract. Verizon performs by delivering you the phone and promising to provide you cellular service in the future. In this case, Verizon has two performance obligations: (1) to provide the phone and (2) to provide cellular service in the future.
- Step 3. Determine the transaction price. The transaction price is the amount the seller is entitled to receive in exchange for the goods and services they have provided. In the case of the McDonald's hamburger, the transaction price is the amount paid for the hamburger. In the case of Verizon, the transaction price must be estimated for the phone (the first performance obligation) and cellular service (the second performance obligation).
- Step 4. Allocate the transaction price to the separate performance obligations. Since the sale of a McDonald's hamburger involves the sale of a single item that is immediately delivered, the entire transaction price is allocated to the hamburger. In more complex transactions, such as a Verizon cellular service contract, the revenue received from the customer must be allocated among the performance obligations. This allocation is often based on the stand-alone (separate) price of each good or service. For example, Verizon should allocate the revenue from the customer between the phone

¹ Accounting Standards Update, *Revenue from Contracts with Customers (Topic 606)*, Financial Accounting Standards Board, May 2014, Norwalk, CT.

(first performance obligation) and the commitment to provide cellular service (second performance obligation).

• Step 5. Recognize revenue when each separate performance obligation is satisfied. The seller should recognize (record) revenue as each performance obligation is satisfied. In the case of McDonald's, the performance obligation is satisfied when the clerk delivers the hamburger to the customer. At this point, the control of the hamburger has passed to the customer. In the case of Verizon, it satisfies its first performance obligation when it delivers you the phone. Verizon satisfies its second performance obligation over time by providing you cellular service. Thus, Verizon should record some revenue at the time you sign the contract and receive your phone and some revenue as you are provided cellular service.

To illustrate, assume that on March 1, 2016, Chandler Evans upgrades (replaces) his cell phone with Star Cellular at no cost by signing a two-year agreement. The new agreement cannot be cancelled and requires a payment of \$90 per month. The cell phone selected by Evans cost Star Cellular \$250.

The five-step method would be applied by Star Cellular as follows:

- Step 1. *Identify the contract with the customer*. The contract with Chandler Evans is the two-year cellular service agreement that includes delivery of a new cell phone.
- Step 2. Identify the separate performance obligations in the contract. Star Cellular
  has two separate performance obligations to Evans under the contract. First, Star
  Cellular must deliver a new cell phone at the time that Evans signs the service
  agreement. Second, Star Cellular must provide Evans cell service for two years.
- Step 3. Determine the transaction price. The transaction price is the total amount Star Cellular will receive over the contract period. In this case, Star Cellular will receive  $$2,160 ($90 \times 24 \text{ months})$  over the contract period.²
- Step 4. *Allocate the transaction price to the separate performance obligations*. Assume that Star Cellular sells the cell phone and cell service separately at the following prices:

Cell phone	\$ 600
Cell service for two years	3,000
Total price if sold separately	\$3,600

The transaction price is allocated to each performance obligation based upon what each obligation would sell for separately as a stand-alone product. To illustrate, the cell phone is allocated \$360 of the transaction price of \$2,160, computed as follows:

$$\text{Cell Phone = Contract Price} \times \frac{\text{Price of Cell Phone Sold Separately}}{\text{Total Price of Cell Phone and Cell Service Sold Separately}}$$

Cell Phone = 
$$$2,160 \times \frac{$600}{$3,600} = $360$$

The cell service is allocated \$1,800 of the transaction price of \$2,160, computed as follows:

$$\label{eq:Cell Service} \textit{Cell Service Sold Separately} \\ \frac{\textit{Price of Cell Service Sold Separate}}{\textit{Total Price of Cell Phone and Cell Service Sold Separate}}$$

Cell Service = 
$$$2,160 \times \frac{$3,000}{$3,600} = $1,800$$

 $^{^{2}}$  An interest component may need to be considered in long-term contracts. To simplify, we ignore interest.

• Step 5. Recognize revenue when each separate performance obligation is satisfied. The \$360 of revenue from the cell phone is recognized when the customer signs the service agreement and receives the phone. At this point, the first performance obligation has been satisfied by Star Cellular and the control of the phone has passed to the customer. The journal entry to record cell phone revenue on March 1, 2016, is as follows:

2016 Mar.	1	Accounts Receivable—Chandler Evans Sales Cost of Merchandise Sold Merchandise Inventory	360 250	360 250	
		merenanaise inventory		250	

The \$1,800 of cell service revenue is recognized as the performance obligation is satisfied over the two-year term of the contract. For example,  $$75 ($1,800 \div 24 \text{ months})$$  of service revenue would be recorded each month. The journal entry to record the service revenue for March is as follows:

Mar. 31 Cash Accounts Receivable (\$360 ÷ 24 months) Cell Service Revenue (\$1,800 ÷ 24 months)	90	15 75	
-------------------------------------------------------------------------------------------------	----	----------	--

The preceding journal entries illustrate how over the life of the two-year contract the total revenue from the contract of \$2,160 is divided between the sale of the cell phone (\$360 of revenue) and providing of cell service (\$1,800 of revenue). In addition, the journal entries illustrate when revenue from the phone and service is recorded.

Exhibit 1 summarizes the division of revenue and its recording over the two-year contract.

#### **EXHIBIT 1**

#### **Recording Revenue over Two-Year Contract**

#### **Recording Revenue over Two-Year Contract** Total Revenue over **Signing of Contract** Two-Year Mar. 31 Apr. 30 Jan. 31 Mar. 1 Dec. 31 Jan. 31 Dec. 31 Feb. 28 Contract Sale of Phone \$ 360 Cell Service \$75 \$75 \$75 \$75 1,800 Total Revenue of \$1,110 [\$360 + (\$75 × Total Revenue of \$900 Total Revenue of \$150 \$2,160 10 months)] $($75 \times 12 \text{ months})$ $($75 \times 2 \text{ months})$ 2016: \$1,110 2017: 900 2017 2016 2018 2018: 150

# Glossary

### A

- **absorption costing** The reporting of the costs of manufactured products, normally direct materials, direct labor, and factory overhead, as product costs. (Chs. 19, 20)
- accelerated depreciation method A depreciation method that provides for a higher depreciation amount in the first year of the asset's use, followed by a gradually declining amount of depreciation. (Ch. 9)
- **account** An accounting form that is used to record the increases and decreases in each financial statement item. (Ch. 2)
- **account form** The form of balance sheet that resembles the basic format of the accounting equation, with assets on the left side and Liabilities and Stockholder's Equity sections on the right side. (Chs. 1, 5)
- **account payable** The liability created by a purchase on account. (Ch. 1)
- account receivable A claim against the customer created by selling merchandise or services on credit. (Chs. 1, 2, 8)
- **accounting** An information system that provides reports to stakeholders about the economic activities and condition of a business. (Ch. 1)
- **accounting cycle** The process that begins with analyzing and journalizing transactions and ends with the post-closing trial balance. (Ch. 4)
- **accounting equation** Assets = Liabilities + Stockholder's Equity. (Ch. 1)
- **accounting period concept** The accounting concept that assumes that the economic life of the business can be divided into time periods. (Ch. 3)
- accounts payable subsidiary ledger The subsidiary ledger containing the individual accounts with suppliers (creditors). (Ch. 5)
- **accounts receivable analysis** A company's ability to collect its accounts receivable. (Ch. 15)
- accounts receivable subsidiary ledger The subsidiary ledger containing the individual accounts with customers. (Ch. 5)
- accounts receivable turnover The relationship between net sales and accounts receivable, computed by

- dividing the net sales by the average net accounts receivable; measures how frequently during the year the accounts receivable are being converted to cash. (Chs. 8, 15)
- **accrual basis of accounting** Under this basis of accounting, revenues and expenses are reported in the income statement in the period in which they are earned or incurred. (Ch. 3)
- accrued expenses Expenses that have been incurred but not recorded in the accounts. (Ch. 3)
- **accrued revenues** Revenues that have been earned but not recorded in the accounts. (Ch. 3)
- **Accumulated Depreciation** The contra asset account credited when recording the depreciation of a fixed asset. (Ch. 3)
- accumulated other comprehensive income The cumulative effects of other comprehensive income items reported separately in the Stockholders' Equity section of the balance sheet. (Ch. 13)
- activity analysis The study of employee effort and other business records to determine the cost of activities. (Ch. 27)
- activities The types of work, or actions, involved in a manufacturing process or service activity. (Ch. 26)
- activity base (driver) A measure of activity that is related to changes in cost. Used in analyzing and classifying cost behavior. Activity bases are also used in the denominator in calculating the predetermined factory overhead rate to assign overhead costs to cost objects. (Chs. 17, 19, 26)
- activity rate The estimated activity cost divided by estimated activity-base usage. (Ch. 26)
- activity-based costing (ABC) A cost allocation method that identifies activities causing the incurrence of costs and allocates these costs to products (or other cost objects), based on activity drivers (bases). (Chs. 17, 26)
- **adjusted trial balance** The trial balance prepared after all the adjusting entries have been posted. (Ch. 3)
- **adjusting entries** The journal entries that bring the accounts up to date at the end of the accounting period. (Ch. 3)
- **adjusting process** An analysis and updating of the accounts when financial statements are prepared. (Ch. 3)

- administrative expenses (general expenses)
  Expenses incurred in the administration or general operations of the business. (Ch. 5)
- **aging the receivables** The process of analyzing the accounts receivable and classifying them according to various age groupings, with the due date being the base point for determining age. (Ch. 8)
- **Allowance for Doubtful Accounts** The contra asset account for accounts receivable. (Ch. 8)
- **allowance method** The method of accounting for uncollectible accounts that provides an expense for uncollectible receivables in advance of their writeoff. (Ch. 8)
- **amortization** The periodic transfer of the cost of an intangible asset to expense. (Chs. 9, 12)
- **annuity** A series of equal cash flows at fixed intervals. (Chs. 12, 25)
- appraisal costs Costs to detect, measure, evaluate, and audit products and process to ensure that they conform to customer requirements and performance standards. (Ch. 27)
- assets The resources owned by a business. (Chs. 1, 2)
- **available-for-sale securities** Securities that management expects to sell in the future but which are not actively traded for profit. (Ch. 13)
- average rate of return A method of evaluating capital investment proposals that focuses on the expected profitability of the investment. (Ch. 25)

### B

- **backflush accounting** Simplification of the accounting system by eliminating accumulation and transfer of costs as products move through production. (Ch. 27)
- **bad debt expense** The operating expense incurred because of the failure to collect receivables. (Ch. 8)
- balance of the account The amount of the difference between the debits and the credits that have been entered into an account. (Ch. 2)
- **balance sheet** A list of the assets, liabilities, and owner's equity as of a specific date, usually at the close of the last day of a month or a year. (Ch. 1)
- **balanced scorecard** A performance evaluation approach that incorporates multiple performance dimensions by combining financial and nonfinancial measures. (Ch. 23)
- **bank reconciliation** The analysis that details the items responsible for the difference between the cash balance reported in the bank statement and the balance of the cash account in the ledger. (Ch. 7)
- **bank statement** A summary of all transactions mailed to the depositor or made available online by the bank each month. (Ch. 7)
- **batch size** The amount of production in units of product that is produced after a setup. (Ch. 27)
- **bond** A form of an interest-bearing note used by corporations to borrow on a long-term basis. (Ch. 12)
- **bond indenture** The contract between a corporation issuing bonds and the bondholders. (Ch. 12)
- **book value** The cost of a fixed asset minus accumulated depreciation on the asset. (Ch. 9)

- book value of the asset (or net book value) The difference between the cost of a fixed asset and its accumulated depreciation. (Ch. 3)
- **boot** The amount a buyer owes a seller when a fixed asset is traded in on a similar asset. (Ch. 9)
- **break-even point** The level of business operations at which revenues and expired costs are equal. (Ch. 19)
- **budget** An accounting device used to plan and control resources of operational departments and divisions. (Ch. 21)
- **budget performance report** A report comparing actual results with budget figures. (Ch. 8)
- **budgetary slack** Excess resources set within a budget to provide for uncertain events. (Ch. 21)
- **budgeted variable factory overhead** The standard variable overhead for the actual units produced. (Ch. 22)
- **business** An organization in which basic resources (inputs), such as materials and labor, are assembled and processed to provide goods or services (outputs) to customers. (Ch. 1)
- business combination A business making an investment in another business by acquiring a controlling share, often greater than 50%, of the outstanding voting stock of another corporation by paying cash or exchanging stock. (Ch. 13)
- **business entity concept** A concept of accounting that limits the economic data in the accounting system to data related directly to the activities of the business. (Ch. 1)
- **business transaction** An economic event or condition that directly changes an entity's financial condition or directly affects its results of operations. (Ch. 1)

#### C

- **capital expenditures** The costs of acquiring fixed assets, adding to a fixed asset, improving a fixed asset, or extending a fixed asset's useful life. (Ch. 9)
- **capital expenditures budget** The budget summarizing future plans for acquiring plant facilities and equipment. (Ch. 21)
- capital investment analysis The process by which management plans, evaluates, and controls long-term capital investments involving property, plant, and equipment. (Ch. 25)
- **capital rationing** The process by which management plans, evaluates, and controls long-term capital investments involving fixed assets. (Ch. 25)
- carrying amount The balance of the bonds payable account (face amount of the bonds) less any unamortized discount or plus any unamortized premium. (Ch. 12)
- cash Coins, currency (paper money), checks, money orders, and money on deposit that is available for unrestricted withdrawal from banks and other financial institutions. (Ch. 7)
- cash basis of accounting Under this basis of accounting, revenues and expenses are reported in the income statement in the period in which cash is received or paid. (Ch. 3)

- cash budget A budget of estimated cash receipts and payments. (Ch. 21)
- **cash dividend** A cash distribution of earnings by a corporation to its shareholders. (Ch. 11)
- **cash equivalents** Highly liquid investments that are usually reported with cash on the balance sheet. (Ch. 7)
- cash flow per share Normally computed as cash flow from operations per share. (Ch. 14)
- cash flows from financing activities The section of the statement of cash flows that reports cash flows from transactions affecting the equity and debt of the business. (Ch. 14)
- cash flows from investing activities The section of the statement of cash flows that reports cash flows from transactions affecting investments in noncurrent assets. (Ch. 14)
- cash flows from operating activities The section of the statement of cash flows that reports the cash transactions affecting the determination of net income. (Ch. 14)
- cash payback period The expected period of time that will elapse between the date of a capital expenditure and the complete recovery in cash (or equivalent) of the amount invested. (Ch. 25)
- cash short and over account An account which has recorded errors in cash sales or errors in making change causing the amount of actual cash on hand to differ from the beginning amount of cash plus the cash sales for the day. (Ch. 7)
- **Certified Public Accountant (CPA)** Public accountants who have met a state's education, experience, and examination requirements. (Ch. 1)
- **chart of accounts** A list of the accounts in the ledger. (Ch. 2)
- **clearing account** Another name for the income summary account because it has the effect of clearing the revenue and expense accounts of their balances. (Ch. 4)
- **closing entries** The entries that transfer the balances of the revenue, expense, and drawing accounts to the owner's capital account. (Ch. 4)
- closing process The transfer process of converting temporary account balances to zero by transferring the revenue and expense account balances to Income Summary, transferring the income summary account balance to the owner's capital account, and transferring the owner's drawing account to the owner's capital account. (Ch. 4)
- **closing the books** The process of transferring temporary accounts balances to permanent accounts at the end of the accounting period. (Ch. 4)
- **common stock** The stock outstanding when a corporation has issued only one class of stock. (Chs. 1, 2, 11)
- **common-sized statement** A financial statement in which all items are expressed only in relative terms. (Ch. 15)
- **compensating balance** A requirement by some banks requiring depositors to maintain minimum cash balances in their bank accounts. (Ch. 7)

- **comprehensive income** All changes in stockholders' equity during a period, except those resulting from dividends and stockholders' investments. (Ch. 13)
- **consigned inventory** Merchandise that is shipped by manufacturers to retailers who act as the manufacturer's selling agent. (Ch. 6)
- **consignee** The name for the retailer in a consigned inventory arrangement. (Ch. 6)
- **consignor** The name for the manufacturer in a consigned inventory arrangement. (Ch. 6)
- **consolidated financial statements** Financial statements resulting from combining parent and subsidiary statements. (Ch. 13)
- **contingent liabilities** Liabilities that may arise from past transactions if certain events occur in the future. (Ch. 10)
- **continuous budgeting** A method of budgeting that provides for maintaining a 12-month projection into the future. (Ch. 21)
- **continuous process improvement** A management approach that is part of the overall total quality management philosophy. The approach requires all employees to constantly improve processes of which they are a part or for which they have managerial responsibility. (Ch. 16)
- contra accounts (or contra asset accounts) An account offset against another account. (Ch. 3)
- contract rate The periodic interest to be paid on the bonds that is identified in the bond indenture; expressed as a percentage of the face amount of the bond. (Ch. 12)
- **contribution margin** Sales less variable costs and variable selling and administrative expenses. (Chs. 19, 20)
- contribution margin analysis The systematic examination of the differences between planned and actual contribution margins. (Ch. 20)
- **contribution margin ratio** The percentage of each sales dollar that is available to cover the fixed costs and provide an operating income. (Ch. 19)
- **control environment** The overall attitude of management and employees about the importance of controls. (Ch. 7)
- **controllable costs** Costs that can be influenced (increased, decreased, or eliminated) by someone such as a manager or factory worker. (Ch. 20)
- **controllable expenses** Costs that can be influenced by the decisions of a manager. (Ch. 23)
- **controllable revenues** Revenues earned by the profit center. (Ch. 23)
- **controllable variance** The difference between the actual amount of variable factory overhead cost incurred and the amount of variable factory overhead budgeted for the standard product. (Ch. 22)
- **controller** The chief management accountant of a division or other segment of a business. (Ch. 16)
- **controlling** A phase in the management process that consists of monitoring the operating results of implemented plans and comparing the actual results with the expected results. (Ch. 16)

- controlling account The account in the general ledger that summarizes the balances of the accounts in a subsidiary ledger. (Ch. 5)
- conversion costs The combination of direct labor and factory overhead costs. (Chs. 16, 27)
- copyright An exclusive right to publish and sell a literary, artistic, or musical composition. (Ch. 9)
- corporation A business organized under state or federal statutes as a separate legal entity. (Ch. 1)
- correcting journal entry An entry that is prepared when an error has already been journalized and posted. (Ch. 2)
- cost A payment of cash (or a commitment to pay cash in the future) for the purpose of generating revenues. (Ch. 16)
- cost accounting systems Systems that measure, record, and report product costs. (Ch. 17)
- cost allocation The process of assigning indirect cost to a cost object, such as a job. (Ch. 17)
- **cost behavior** The manner in which a cost changes in relation to its activity base (driver). (Ch. 19)
- cost center A decentralized unit in which the department or division manager has responsibility for the control of costs incurred and the authority to make decisions that affect these costs. (Ch. 23)
- cost concept A concept of accounting that determines the amount initially entered into the accounting records for purchases. (Ch. 1)
- cost method A method of accounting for equity investments representing less than 20% of the outstanding shares of the investee. The purchase is at original cost, and any gains or losses upon sale are recognized by the difference between the sale proceeds and the original cost. (Ch. 13)
- cost object The object or segment of operations to which costs are related for management's use, such as a product or department. (Ch. 16)
- cost of finished goods available for sale The beginning finished goods inventory added to the cost of goods manufactured during the period. (Ch. 16)
- cost of goods manufactured The total cost of making and finishing a product. (Ch. 16)
- cost of goods sold The cost of finished goods available for sale minus the ending finished goods inventory. (Ch. 16)
- cost of goods sold budget A budget of the estimated direct materials, direct labor, and factory overhead consumed by sold products. (Ch. 21)
- cost of merchandise sold The cost that is reported as an expense when merchandise is sold. (Chs. 5, 16)
- cost of production report A report prepared periodically by a processing department, summarizing (1) the units for which the department is accountable and the disposition of those units and (2) the costs incurred by the department and the allocation of those costs between completed and incomplete production. (Ch. 18)
- cost of quality report A report summarizing the costs, percent of total, and percent of sales by appraisal,

- prevention, internal failure, and external failure cost of quality categories. (Ch. 27)
- cost per equivalent unit The rate used to allocate costs between completed and partially completed production. (Ch. 18)
- cost price approach An approach to transfer pricing that uses cost as the basis for setting the transfer
- cost variance The difference between actual cost and the flexible budget at actual volumes. (Ch. 22)
- costs of quality The cost associated with controlling quality (prevention and appraisal) and failing to control quality (internal and external failure). (Ch. 27)
- cost-volume-profit analysis The systematic examination of the relationships among selling prices, volume of sales and production, costs, expenses, and profits. (Ch. 19)
- cost-volume-profit chart A chart used to assist management in understanding the relationships among costs, expenses, sales, and operating profit or loss.
- credit Amount entered on the right side of an account. (Ch. 2)
- credit memorandum (credit memo) A form used by a seller to inform the buyer of the amount the seller proposes to credit to the account receivable due from the buyer. (Ch. 5)
- credit period The amount of time the buyer is allowed in which to pay the seller. (Ch. 5)
- credit terms Terms for payment on account by the buyer to the seller. (Ch. 5)
- cumulative preferred stock Stock that has a right to receive regular dividends that were not declared (paid) in prior years. (Ch. 11)
- **currency exchange rate** The rate at which currency in another country can be exchanged for local currency. (Ch. 25)
- current assets Cash and other assets that are expected to be converted to cash or sold or used up, usually within one year or less, through the normal operations of the business. (Ch. 4)
- current liabilities Liabilities that will be due within a short time (usually one year or less) and that are to be paid out of current assets. (Ch. 4)
- current position analysis A company's ability to pay its current liabilities. (Chs. 10, 15)
- current ratio A financial ratio that is computed by dividing current assets by current liabilities. (Chs. 4, 15)
- currently attainable standards Standards that represent levels of operation that can be attained with reasonable effort. (Ch. 22)
- customer discounts A variety of discounts offered by the seller as incentive for the customer to act in a way benefiting the seller. (Ch. 5)
- customer returns and allowances Sometimes called sales returns and allowances, these are returns to the seller by the customer or reductions from the initial selling price due to defective or damaged merchandise or goods that did not meet the customer's expectations. (Ch. 5)



- **debit** Amount entered on the left side of an account. (Ch. 2)
- **debit memorandum (debit memo)** A form used by a buyer to inform the seller of the amount the buyer proposes to debit to the account payable due the seller. (Ch. 5)
- **debt securities** Notes and bond investments that provide interest revenue over a fixed maturity. (Ch. 13)
- **decision making** A component inherent in the other management processes of planning, directing, controlling, and improving. (Ch. 16)
- **deficiency** The debit balance in the owner's equity account of a partner. (Ch. 12)
- **defined benefit plan** A pension plan that promises employees a fixed annual pension benefit at retirement, based on years of service and compensation levels. (Ch. 10)
- **defined contribution plan** A pension plan that requires a fixed amount of money to be invested on the employee's behalf during the employee's working years. (Ch. 10)
- **depletion** The process of transferring the cost of natural resources to an expense account. (Ch. 9)
- **depreciate** To lose usefulness as all fixed assets except land do. (Ch. 3)
- **depreciation** The systematic periodic transfer of the cost of a fixed asset to an expense account during its expected useful life. (Chs. 3, 9)
- **depreciation expense** The portion of the cost of a fixed asset that is recorded as an expense each year of its useful life. (Ch. 3)
- differential analysis The area of accounting concerned with the effect of alternative courses of action on revenues and costs. (Ch. 24)
- differential cost The amount of increase or decrease in cost expected from a particular course of action compared with an alternative. (Ch. 24)
- **differential income (loss)** The difference between the differential revenue and the differential costs. (Ch. 24)
- differential revenue The amount of increase or decrease in revenue expected from a particular course of action as compared with an alternative. (Ch. 24)
- **direct costs** Costs that can be traced directly to a cost object. (Ch. 16)
- **direct labor cost** The wages of factory workers who are directly involved in converting materials into a finished product. (Ch. 16)
- direct labor cost budget Budget that estimates direct labor hours and related costs needed to support budgeted production. (Ch. 21)
- direct labor rate variance The cost associated with the difference between the standard rate and the actual rate paid for direct labor used in producing a commodity. (Ch. 22)
- direct labor time variance The cost associated with the difference between the standard hours and the actual hours of direct labor spent producing a commodity. (Ch. 22)

- **direct materials cost** The cost of materials that are an integral part of the finished product. (Ch. 16)
- direct materials price variance The cost associated with the difference between the standard price and the actual price of direct materials used in producing a commodity. (Ch. 22)
- **direct materials purchases budget** A budget that uses the production budget as a starting point to budget materials purchases. (Ch. 21)
- direct materials quantity variance The cost associated with the difference between the standard quantity and the actual quantity of direct materials used in producing a commodity. (Ch. 22)
- direct method A method of reporting the cash flows from operating activities as the difference between the operating cash receipts and the operating cash payments. (Ch. 14)
- direct write-off method The method of accounting for uncollectible accounts that recognizes the expense only when accounts are judged to be worthless. (Ch. 8)
- **directing** The process by which managers, given their assigned level of responsibilities, run day-to-day operations. (Ch. 16)
- **discount** The interest deducted from the maturity value of a note or the excess of the face amount of bonds over their issue price. (Chs. 11, 12)
- **dishonored note receivable** A note that the maker fails to pay on the due date. (Ch. 8)
- **dividend yield** A ratio, computed by dividing the annual dividends paid per share of common stock by the market price per share at a specific date, that indicates the rate of return to stockholders in terms of cash dividend distributions. (Ch. 15)
- **dividends** Distribution of a corporation's earnings to stockholders. (Chs. 1, 2)
- **dividends per share** Measures the extent to which earnings are being distributed to common shareholders. (Ch. 15)
- double-declining-balance method A method of depreciation that provides periodic depreciation expense based on the declining book value of a fixed asset over its estimated life. (Ch. 9)
- **double-entry accounting system** A system of accounting for recording transactions, based on recording increases and decreases in accounts so that debits equal credits. (Ch. 2)
- **DuPont formula** An expanded expression of return on investment determined by multiplying the profit margin by the investment turnover. (Ch. 23)

#### E

- earnings The amount by which revenues exceed expenses. (Ch. 1)
- earnings per common share (EPS) Net income per share of common stock outstanding during a period. (Chs. 11, 12)
- earnings per share (EPS) on common stock The profitability ratio of net income available to common shareholders to the number of common shares outstanding. (Ch. 15)

- effective interest rate method The method of amortizing discounts and premiums that provides for a constant rate of interest on the carrying amount of the bonds at the beginning of each period; often called simply the "interest method." (Ch. 12)
- electronic data interchange (EDI) An information technology that allows different business organizations to use computers to communicate orders, relay information, and make or receive payments. (Ch. 27)
- **effective rate of interest** The market rate of interest at the time bonds are issued. (Ch. 12)
- **electronic funds transfer (EFT)** A system in which computers rather than paper (money, checks, etc.) are used to effect cash transactions. (Ch. 7)
- elements of internal control The control environment, risk assessment, control activities, information and communication, and monitoring. (Ch. 7)
- **employee involvement** A philosophy that grants employees the responsibility and authority to make their own decisions about their operations. (Ch. 27)
- **employee fraud** The intentional act of deceiving an employer for personal gain. (Ch. 7)
- employee's earnings record A detailed record of each employee's earnings. (Ch. 10)
- **engineering change order (ECO)** The document that initiates changing a product or process. (Ch. 26)
- enterprise resource planning (ERP) An integrated business and information system used by companies to plan and control both internal and supply chain operations. (Ch. 27)
- **equity method** A method of accounting for an investment in common stock by which the investment account is adjusted for the investor's share of periodic net income and cash dividends of the investee. (Ch. 13)
- **equity securities** The common and preferred stock of a firm. (Ch. 13)
- equivalent units of production The number of production units that could have been completed within a given accounting period, given the resources consumed. (Ch. 18)
- **ethics** Moral principles that guide the conduct of individuals. (Ch. 1)
- **expenses** Assets used up or services consumed in the process of generating revenues. (Chs. 1, 2)
- **external failure costs** The costs incurred after defective units or services have been delivered to consumers. (Ch. 27)
- **extraordinary item** An event or a transaction that is both (1) unusual in nature and (2) infrequent in occurrence. (Ch. 15)

- **face amount** An amount at which bonds sell if the market rate equals the contract rate. (Ch. 12)
- **factory burden** Another term for manufacturing overhead or factory overhead. (Ch. 16)
- **factory overhead cost** All of the costs of producing a product except for direct materials and direct labor. (Ch. 16)

- **factory overhead cost budget** Budget that estimates the cost for each item of factory overhead needed to support budgeted production. (Ch. 21)
- factory overhead cost variance report Reports budgeted and actual costs for variable and fixed factory overhead along with the related controllable and volume variances. (Ch. 22)
- **fair value** The price that would be received for selling an asset or paying off a liability, often the market price for an equity or debt security. (Ch. 13)
- **favorable cost variance** A variance that occurs when the actual cost is less than standard cost. (Ch. 22)
- **feedback** Measures provided to operational employees or managers on the performance of subunits of the organization. These measures are used by employees to adjust a process or a behavior to achieve goals. See management by exception. (Ch. 16)
- fees earned Revenue from providing services. (Ch. 1)
- **FICA tax** Federal Insurance Contributions Act tax used to finance federal programs for old-age and disability benefits (social security) and health insurance for the aged (Medicare). (Ch. 10)
- **financial accounting** The branch of accounting that is concerned with recording transactions using generally accepted accounting principles (GAAP) for a business or other economic unit and with a periodic preparation of various statements from such records. (Chs. 1, 16)
- **Financial Accounting Standards Board (FASB)** The authoritative body that has the primary responsibility for developing accounting principles. (Ch. 1)
- **financial statements** Financial reports that summarize the effects of events on a business. (Ch. 1)
- **finished goods inventory** The direct materials costs, direct labor costs, and factory overhead costs of finished products that have not been sold. (Ch. 16)
- **finished goods ledger** The subsidiary ledger that contains the individual accounts for each kind of commodity or product produced. (Ch. 17)
- first-in, first-out (FIFO) inventory cost flow method The method of inventory costing based on the assumption that the costs of merchandise sold should be charged against revenue in the order in which the costs were incurred. (Chs. 6, 18)
- **fiscal year** The annual accounting period adopted by a business. (Ch. 4)
- **fixed asset turnover ratio** The number of dollars of sales that are generated from each dollar of average fixed assets during the year, computed by dividing the net sales by the average net fixed assets. (Ch. 9)
- **fixed assets (or plant assets)** Long-term or relatively permanent tangible assets such as equipment, machinery, and buildings that are used in the normal business operations and that depreciate over time. (Chs. 3, 4, 9)
- **fixed costs** Costs that tend to remain the same in amount, regardless of variations in the level of activity. (Ch. 19)
- **flexible budget** A budget that adjusts for varying rates of activity. (Ch. 21)

- **FOB** (free on board) destination Freight terms in which the seller pays the transportation costs from the shipping point to the final destination. (Ch. 5)
- **FOB** (free on board) shipping point Freight terms in which the buyer pays the transportation costs from the shipping point to the final destination. (Ch. 5)
- free cash flow The amount of operating cash flow remaining after replacing current productive capacity and maintaining current dividends. (Ch. 14)
- fringe benefits Benefits provided to employees in addition to wages and salaries. (Ch. 10)
- **future value** The value of an asset or cash at a specified date in the future that is equivalent in value to a specified sum today. (Ch. 12)

#### G

- **general ledger** The primary ledger, when used in conjunction with subsidiary ledgers, that contains all of the balance sheet and income statement accounts. (Ch. 5)
- **general-purpose financial statements** A type of financial accounting report that is distributed to external users. The term "general purpose" refers to the wide range of decision-making needs that the reports are designed to serve. (Ch. 1)
- generally accepted accounting principles (GAAP) Generally accepted guidelines for the preparation of financial statements. (Ch. 1)
- **goal conflict** A condition that occurs when individual objectives conflict with organizational objectives. (Ch. 21)
- **goodwill** An intangible asset that is created from such favorable factors as location, product quality, reputation, and managerial skill. (Ch. 9)
- **gross pay** The total earnings of an employee for a payroll period. (Ch. 10)
- gross profit Sales minus the cost of merchandise sold.
   (Ch. 5)
- **gross profit method** A method of estimating inventory cost that is based on the relationship of gross profit to sales. (Ch. 6)

## H

- **held-to-maturity securities** Investments in bonds or other debt securities that management intends to hold to their maturity. (Ch. 13)
- **high-low method** A technique that uses the highest and lowest total costs as a basis for estimating the variable cost per unit and the fixed cost component of a mixed cost. (Ch. 19)
- **horizontal analysis** Financial analysis that compares an item in a current statement with the same item in prior statements. (Chs. 2, 15)

ideal standards Standards that can be achieved only under perfect operating conditions, such as no idle time, no machine breakdowns, and no materials spoilage; also called theoretical standards. (Ch. 22)

- in arrears Cumulative preferred stock dividends that have not been paid in prior years are said to be in arrears. (Ch. 11)
- income from operations (operating income) Revenues less operating expenses and service department charges for a profit or an investment center. (Ch. 5)
- **income statement** A summary of the revenue and expenses for a specific period of time, such as a month or a year. (Ch. 1)
- **Income Summary** An account to which the revenue and expense account balances are transferred at the end of a period. (Ch. 4)
- **indirect costs** Costs that cannot be traced directly to a cost object. (Ch. 16)
- indirect method A method of reporting the cash flows from operating activities as the net income from operations adjusted for all deferrals of past cash receipts and payments and all accruals of expected future cash receipts and payments. (Ch. 14)
- **inflation** A period when prices in general are rising and the purchasing power of money is declining. (Ch. 25)
- **installment note** A debt that requires the borrower to make equal periodic payments to the lender for the term of the note. (Ch. 12)
- **intangible assets** Long-term assets that are useful in the operations of a business, are not held for sale, and are without physical qualities. (Ch. 9)
- interest revenue Money received for interest. (Ch. 1)
- internal controls The policies and procedures used to safeguard assets, ensure accurate business information, and ensure compliance with laws and regulations. (Ch. 7)
- **internal failure costs** The costs associated with defects that are discovered by the organization before the product or service is delivered to the consumer. (Ch. 27)
- internal rate of return (IRR) method A method of analysis of proposed capital investments that uses present value concepts to compute the rate of return from the net cash flows expected from the investment. (Ch. 25)
- International Accounting Standards Board (IASB)
  An organization that issues International Financial
  Reporting Standards for many countries outside the
  United States. (Ch. 1)
- **inventory analysis** A company's ability to manage its inventory effectively. (Ch. 15)
- inventory shrinkage (inventory shortage) The amount by which the merchandise for sale, as indicated by the balance of the merchandise inventory account, is larger than the total amount of merchandise counted during the physical inventory. (Ch. 5)
- inventory subsidiary ledger A ledger containing individual accounts with a common characteristic.(Ch. 5)
- **inventory turnover** The relationship between the volume of goods sold and inventory, computed by dividing the cost of goods sold by the average inventory. (Chs. 6, 15)

- **investee** The company whose stock is purchased by the investor. (Ch. 13)
- **investment center** A decentralized unit in which the manager has the responsibility and authority to make decisions that affect not only costs and revenues but also the fixed assets available to the center. (Ch. 23)
- **investment turnover** A component of the rate of return on investment, computed as the ratio of sales to invested assets. (Ch. 23)
- **investments** The balance sheet caption used to report long-term investments in stocks not intended as a source of cash in the normal operations of the business. (Ch. 13)
- **investor** The company investing in another company's stock. (Ch. 13)
- **invoice** The bill that the seller sends to the buyer. (Ch. 5)

## J

- **job cost sheet** An account in the work in process subsidiary ledger in which the costs charged to a particular job order are recorded. (Ch. 17)
- **job order cost system** A type of cost accounting system that provides for a separate record of the cost of each particular quantity of product that passes through the factory. (Ch. 17)
- **journal** The initial record in which the effects of a transaction are recorded. (Ch. 2)
- **journal entry** The form of recording a transaction in a journal. (Ch. 2)
- **journalizing** The process of recording a transaction in the journal. (Ch. 2)

- last-in, first-out (LIFO) inventory cost flow method A method of inventory costing based on the assumption that the most recent merchandise inventory costs should be charged against revenue. (Ch. 6)
- **lead time** The elapsed time between starting a unit of product into the beginning of a process and its completion. (Ch. 27)
- **lean accounting** An accounting system characterized by fewer transactions, combined accounts, nonfinancial performance measures, and direct tracing of overhead. (Ch. 27)
- **lean enterprise** A business that produces products or services with high quality, low cost, fast response, and immediate availability using lean principles. (Ch. 27)
- **lean manufacturing (or just-in-time manufacturing)**A manufacturing enterprise that uses lean principles. (Chs. 18, 27)
- **lean principles** Principles associated with the lean enterprise that include reducing inventory, reducing lead time, reducing setup time, product/customer oriented layouts, employee involvement, pull scheduling, zero defects, and supply chain management. (Ch. 27)
- **ledger** A group of accounts for a business. (Ch. 2)

- **leverage** Using debt to increase the return on an investment. (Ch. 15)
- **liabilities** The rights of creditors that represent debts of the business. (Chs. 1, 2)
- **limited liability company (LLC)** A business form consisting of one or more persons or entities filing an operating agreement with a state to conduct business with limited liability to the owners, yet treated as a partnership for tax purposes. (Chs. 1, 12)
- **line department** A unit that is directly involved in the basic objectives of an organization. (Ch. 16)
- **liquidity** The ability to convert assets into cash. (Chs. 4, 15)
- **long-term liabilities** Liabilities that usually will not be due for more than one year. (Ch. 4)
- lower-of-cost-or-market (LCM) method A method of valuing inventory that reports the inventory at the lower of its cost or current market value (replacement cost). (Ch. 6)

## M

- management (or managerial) accounting The branch of accounting that uses both historical and estimated data in providing information that management uses in conducting daily operations, in planning future operations, and in developing overall business strategies. (Chs. 1, 16)
- management by exception The philosophy of managing which involves monitoring the operating results of implemented plans and comparing the expected results with the actual results. This feedback allows management to isolate significant variations for further investigation and possible remedial action. (Ch. 16)
- management process The five basic management functions of (1) planning, (2) directing, (3) controlling, (4) improving, and (5) decision making. (Ch. 16)
- Management's Discussion and Analysis (MD&A) An annual report disclosure that provides management's analysis of the results of operations and financial condition. (Ch. 15)
- manufacturing business A type of business that changes basic inputs into products that are sold to individual customers. (Ch. 1)
- manufacturing cells A grouping of processes where employees are cross-trained to perform more than one function. (Ch. 18)
- manufacturing margin The variable cost of goods sold deducted from sales. (Ch. 20)
- manufacturing overhead Costs, other than direct materials and direct labor costs, that are incurred in the manufacturing process. (Ch. 16)
- margin of safety Indicates the possible decrease in sales that may occur before an operating loss results. (Ch. 19)
- market price approach An approach to transfer pricing that uses the price at which the product or service transferred could be sold to outside buyers as the transfer price. (Ch. 23)

- market rate of interest The rate determined from sales and purchases of similar bonds. (Ch. 12)
- market segment A portion of business that can be assigned to a manager for profit responsibility. (Ch. 20)
- master budget The comprehensive budget plan linking all the individual budgets related to sales, cost of goods sold, operating expenses, projects, capital expenditures, and cash. (Ch. 21)
- matching concept (or matching principle) A concept of accounting in which expenses are matched with the revenue generated during a period by those expenses. (Chs. 1, 3)
- materials inventory The cost of materials that have not yet entered into the manufacturing process. (Ch. 16)
- materials ledger The subsidiary ledger containing the individual accounts for each type of material. (Ch. 17)
- materials requisition The form or electronic transmission used by a manufacturing department to authorize materials issuances from the storeroom. (Ch. 17)
- maturity value The amount that is due at the maturity or due date of a note. (Ch. 8)
- merchandise available for sale The cost of merchandise available for sale to customers calculated by adding the beginning merchandise inventory to net purchases. (Ch. 16)
- merchandise inventory Merchandise on hand (not sold) at the end of an accounting period. (Ch. 5)
- merchandising business A type of business that purchases products from other businesses and sells them to customers. (Ch. 1)
- **mixed costs** Costs with both variable and fixed characteristics, sometimes called semivariable or semi-fixed costs. (Ch. 19)
- **mortgage notes** An installment note that may be secured by a pledge of the borrower's assets. (Ch. 12)
- multiple production department factory overhead rate method A method that allocated factory overhead to product by using factory overhead rates for each production department. (Ch. 26)
- **multiple-step income statement** A form of income statement that contains several sections, subsections, and subtotals. (Ch. 5)

## 1

- **natural business year** A fiscal year that ends when business activities have reached the lowest point in an annual operating cycle. (Ch. 4)
- negotiated price approach An approach to transfer pricing that allows managers of decentralized units to agree (negotiate) among themselves as to the transfer price. (Ch. 23)
- **net income or net profit** The amount by which revenues exceed expenses. (Ch. 1)
- **net loss** The amount by which expenses exceed revenues. (Ch. 1)

- **net pay** Gross pay less payroll deductions; the amount the employer is obligated to pay the employee. (Ch. 10)
- **net present value method** A method of analysis of proposed capital investments that focuses on the present value of the cash flows expected from the investments. (Ch. 25)
- **net realizable value** The estimated selling price of an item of inventory less any direct costs of disposal, such as sales commissions. (Chs. 6, 8)
- **noncontrollable cost** Cost that cannot be influenced (increased, decreased, or eliminated) by someone such as a manager or factory worker. (Ch. 20)
- **nonfinancial measure** A performance measure that has not been stated in dollar terms. (Ch. 27)
- **nonfinancial performance measure** A performance measure expressed in units rather than dollars. (Ch. 22)
- **non-value-added activity** The cost of activities that are perceived as unnecessary from the customer's perspective and are thus candidates for elimination. (Ch. 27)
- **non-value-added lead time** The time that units wait in inventories, move unnecessarily, and wait during machine breakdowns. (Ch. 27)
- **normal balance of an account** The normal balance of an account can be either a debit or a credit depending on whether increases in the account are recorded as debits or credits. (Ch. 2)
- **notes receivable** A customer's written promise to pay an amount and possibly interest at an agreed-upon rate. (Chs. 4, 8)
- **number of days' sales in inventory** The relationship between the volume of sales and inventory, computed by dividing the inventory at the end of the year by the average daily cost of goods sold. (Chs. 6, 15)
- **number of days' sales in receivables** The relationship between sales and accounts receivable, computed by dividing the net accounts receivable at the end of the year by the average daily sales. (Chs. 8, 15)
- number of times interest charges are earned A ratio that measures creditor margin of safety for interest payments, calculated as income before interest and taxes divided by interest expense. (Chs. 12, 15)



- **objectives (goals)** Developed in the planning stage, these reflect the direction and desired outcomes of certain courses of action. (Ch. 16)
- **objectivity concept** A concept of accounting that requires accounting records and the data reported in financial statements to be based on objective evidence. (Ch. 1)
- **operating cycle** The process by which a company spends cash, generates revenues, and receives cash either at the time the revenues are generated or later by collecting an accounts receivable. (Ch. 5)
- **operating leverage** A measure of the relative mix of a business's variable costs and fixed costs, computed

- as contribution margin divided by operating income. (Ch. 19)
- operational planning The development of short-term plans to achieve goals identified in a business's strategic plan. Sometimes called tactical planning. (Ch. 16)
- **opportunity cost** The amount of income forgone from an alternative to a proposed use of cash or its equivalent. (Ch. 24)
- other comprehensive income Specified items that are reported separately from net income, including foreign currency items, pension liability adjustments, and unrealized gains and losses on investments. (Ch. 13)
- **other expense** Expenses that cannot be traced directly to operations. (Ch. 5)
- **other income** Revenue from sources other than the primary operating activity of a business. (Ch. 5)
- **outstanding stock** The stock in the hands of stockholders. (Ch. 11)
- overapplied factory overhead The amount of factory overhead applied in excess of the actual factory overhead costs incurred for production during a period. (Ch. 17)
- **owner's equity** The owner's right to the assets of the business. (Chs. 1, 2)

## P

- par value A dollar amount assigned to each share of stock. (Ch. 11)
- **parent company** The corporation owning all or a majority of the voting stock of the other corporation. (Ch. 13)
- Pareto chart A bar chart that shows the totals of a particular attribute for a number of categories, ranked left to right from the largest to smallest totals. (Ch. 27)
- **partnership** An unincorporated business form consisting of two or more persons conducting business as co-owners for profit. (Ch. 1)
- patents Exclusive rights to produce and sell goods with one or more unique features. (Ch. 9)
- **payroll** The total amount paid to employees for a certain period. (Ch. 10)
- **payroll register** A multicolumn report used to assemble and summarize payroll data at the end of each payroll period. (Ch. 10)
- pension A cash payment to retired employees. (Ch. 10)
- **period costs** Those costs that are used up in generating revenue during the current period and that are not involved in manufacturing a product, such as selling, general, and administrative expenses. (Ch. 16)
- periodic inventory system The inventory system in which the inventory records do not show the amount available for sale or sold during the period. (Ch. 5)
- **perpetual inventory system** The inventory system in which each purchase and sale of merchandise is recorded in an inventory account. (Ch. 5)

- **petty cash fund** A special cash fund to pay relatively small amounts. (Ch. 7)
- **physical inventory** A detailed listing of merchandise on hand. (Chs. 5, 6)
- **planning** A phase of the management process whereby objectives are outlined and courses of action determined. (Ch. 16)
- **posting** The process of transferring the debits and credits from the journal entries to the accounts. (Ch. 2)
- predetermined factory overhead rate The rate used to apply factory overhead costs to the goods manufactured. The rate is determined by dividing the budgeted overhead cost by the estimated activity usage at the beginning of the fiscal period. (Ch. 17)
- **preferred stock** A class of stock with preferential rights over common stock. (Ch. 11)
- **premium** The excess of the issue price of a stock over its par value or the excess of the issue price of bonds over their face amount. (Chs. 11, 12)
- **prepaid expenses** Items such as supplies that will be used in the business in the future. (Chs. 1, 3)
- present value concept Cash to be received (or paid) in the future is not the equivalent of the same amount of money received at an earlier date. (Ch. 25)
- present value index An index computed by dividing the total present value of the net cash flow to be received from a proposed capital investment by the amount to be invested. (Ch. 25)
- present value of an annuity The sum of the present values of a series of equal cash flows to be received at fixed intervals. (Chs. 12, 25)
- **prevention costs** Costs incurred to prevent defects from occurring during the design and delivery of products or services. (Ch. 27)
- **price-earnings (P/E) ratio** The ratio of the market price per share of common stock, at a specific date, to the annual earnings per share. (Ch. 15)
- **prime costs** The combination of direct materials and direct labor costs. (Ch. 16)
- **prior period adjustments** Corrections of material errors related to a prior period or periods, excluded from the determination of net income. (Ch. 11)
- **private accounting** The field of accounting whereby accountants are employed by a business firm or a not-for-profit organization. (Ch. 1)
- **process** A sequence of activities linked together for performing a particular task. (Chs. 22, 27)
- **process cost system** A type of cost system that accumulates costs for each of the various departments within a manufacturing facility. (Chs. 17, 18)
- process manufacturer A manufacturer that uses large machines to process a continuous flow of raw materials through various stages of completion into a finished state. (Ch. 18)
- **process-oriented layout** Organizing work in a plant or administrative function around processes (tasks). (Ch. 27)
- **product cost concept** A concept used in applying the cost-plus approach to product pricing in which only

- the costs of manufacturing the product, termed the product cost, are included in the cost amount to which the markup is added. (Ch. 24)
- **product costing** Determining the cost of a product. (Ch. 26)
- **product costs** The three components of manufacturing cost: direct materials, direct labor, and factory overhead costs. (Ch. 16)
- **production bottleneck** A condition that occurs when product demand exceeds production capacity. (Ch. 24)
- **production budget** A budget of estimated unit production. (Ch. 21)
- production department factory overhead rates Rates determined by dividing the budgeted production department factory overhead by the budgeted allocation base for each department. (Ch. 26)
- **product-oriented layout** Organizing work in a plant or administrative function around products; sometimes referred to as product cells. (Ch. 27)
- **profit** The difference between the amounts received from customers for goods or services provided and the amounts paid for the inputs used to provide the goods or services. (Ch. 1)
- **profit center** A decentralized unit in which the manager has the responsibility and the authority to make decisions that affect both costs and revenues (and thus profits). (Ch. 23)
- **profit margin** A component of the rate of return on investment, computed as the ratio of income from operations to sales. (Ch. 23)
- **profit-volume chart** A chart used to assist management in understanding the relationship between profit and volume. (Ch. 19)
- **profitability** The ability of a firm to earn income. (Ch. 15)
- **proprietorship** A business owned by one individual. (Ch. 1)
- **public accounting** The field of accounting where accountants and their staff provide services on a fee basis. (Ch. 1)
- **pull manufacturing** A just-in-time method wherein customer orders trigger the release of finished goods, which triggers production, which triggers release of materials from suppliers. (Ch. 27)
- **public companies** Companies that issue publicly traded debt or equity securities. (App. C)
- **Public Company Accounting Oversight Board (PCAOB)** A new oversight body for the accounting profession that was established by the Sarbanes-Oxley Act. (Ch. 1)
- **purchase order** The purchase order authorizes the purchase of the inventory from an approved vendor. (Ch. 6)
- **purchases discounts** Discounts taken by the buyer for early payment of an invoice. (Ch. 5)
- **purchases returns and allowances** From the buyer's perspective, returned merchandise or an adjustment for defective merchandise. (Ch. 5)
- **push manufacturing** Materials are released into production and work in process is released into finished goods in anticipation of future sales. (Ch. 27)



- **quantity factor** The effect of a difference in the number of units sold, assuming no change in unit sales price or unit cost. (Ch. 20)
- **quick assets** Cash and other current assets that can be quickly converted to cash, such as marketable securities and receivables. (Chs. 10, 15)
- **quick ratio** A financial ratio that measures the ability to pay current liabilities with quick assets (cash, marketable securities, accounts receivable). (Chs. 10, 15)

#### R

- radio frequency identification devices (RFID) Electronic tags (chips) placed on or embedded within products that can be read by radio waves that allow instant monitoring or production location. (Ch. 27)
- rate earned on common stockholders' equity A measure of profitability computed by dividing net income, reduced by preferred dividend requirements, by common stockholders' equity. (Ch. 15)
- rate earned on stockholders' equity A measure of profitability computed by dividing net income by total stockholders' equity. (Ch. 15)
- rate earned on total assets A measure of the profitability of assets, without regard to the equity of creditors and stockholders in the assets. (Ch. 15)
- rate of return on investment (ROI) A measure of managerial efficiency in the use of investments in assets, computed as income from operations divided by invested assets. (Ch. 23)
- ratio of cash to monthly cash expenses Ratio that helps assess how long a company can continue to operate without additional financing or generating positive cash flows from operations. (Ch. 7)
- ratio of fixed assets to long-term liabilities A leverage ratio that measures the margin of safety of long-term creditors, calculated as the net fixed assets divided by the long-term liabilities. (Ch. 15)
- ratio of liabilities to stockholders' equity A comprehensive leverage ratio that measures the relationship of the claims of creditors to stockholders' equity. (Chs. 1, 15)
- ratio of sales to assets Ratio that measures how effectively a company uses its assets, computed as net sales divided by average total assets. (Chs. 5, 15)
- Raw and In Process (RIP) Inventory The capitalized cost of direct materials purchases, labor, and overhead charged to the production cell. (Ch. 27)
- **real (permanent) accounts** Term for balance sheet accounts because they are relatively permanent and carried forward from year to year. (Ch. 4)
- **receivables** All money claims against other entities, including people, business firms, and other organizations. (Ch. 8)
- **receiving report** The form or electronic transmission used by the receiving personnel to indicate that materials have been received and inspected. (Chs. 6, 17)
- relevant range The range of activity over which changes in cost are of interest to management. (Ch. 19)

- rent revenue Money received for rent. (Ch. 1)
- **report form** The form of balance sheet with the Liabilities and Owner's Equity sections presented below the Assets section. (Ch. 5)
- **residual income** The excess of divisional income from operations over a "minimum" acceptable income from operations. (Ch. 23)
- **residual value** The estimated value of a fixed asset at the end of its useful life. (Ch. 9)
- **responsibility accounting** The process of measuring and reporting operating data by areas of responsibility. (Ch. 23)
- **responsibility center** An organizational unit for which a manager is assigned responsibility over costs, revenues, or assets. (Ch. 21)
- **restrictions** Amounts of retained earnings that have been limited for use as dividends. (Ch. 11)
- **retail inventory method** A method of estimating inventory cost that is based on the relationship of gross profit to sales. (Ch. 6)
- **retained earnings** Net income retained in a corporation. (Chs. 1, 2)
- **retained earnings statement** A summary of the changes in the retained earnings in a corporation for a specific period of time, such as a month or a year. (Chs. 1, 11)
- revenue expenditures Costs that benefit only the current period or costs incurred for normal maintenance and repairs of fixed assets. (Ch. 9)
- revenue recognition concept The concept that supports recording revenues when services have been performed or products delivered to customers. (Ch. 3)
- **revenues** Increases in assets from performing services or delivering products to customers. (Chs. 1, 2)
- rules of debit and credit In the double-entry accounting system, specific rules for recording debits and credits based on the type of account. (Ch. 2)

## S

- sales The total amount charged customers for merchandise sold, including cash sales and sales on account. (Chs. 1, 5)
- sales budget One of the major elements of the income statement budget that indicates the quantity of estimated sales and the expected unit selling price. (Ch. 22)
- **sales discounts** From the seller's perspective, discounts that a seller may offer the buyer for early payment. (Ch. 21)
- sales mix The relative distribution of sales among the various products available for sale. (Chs. 19, 20)
- **Sarbanes-Oxley Act (SOX)** An act passed by Congress to restore public confidence and trust in the financial statements of companies. (Chs. 1, 7)
- Securities and Exchange Commission (SEC) An agency of the U.S. government that has authority over the accounting and financial disclosures for companies whose shares of ownership (stock) are traded and sold to the public. (Ch. 1)

- **selling expenses** Expenses that are incurred directly in the selling of merchandise. (Ch. 5)
- **service business** A business providing services rather than products to customers. (Ch. 1)
- **service department charges** The costs of services provided by an internal service department and transferred to a responsibility center. (Ch. 23)
- **setup** An overhead activity that consists of changing tooling in machines in preparation for making a new product. (Ch. 26)
- single plantwide factory overhead rate method A method that allocates all factory overhead to products by using a single factory overhead rate. (Ch. 26)
- **single-step income statement** A form of income statement in which the total of all expenses is deducted from the total of all revenues. (Ch. 5)
- **Six Sigma** A quality improvement process developed by Motorola Corporation consisting of five steps: define, measure, analyze, improve, and control (DMAIC). (Ch. 27)
- **slide** An error in which the entire number is moved one or more spaces to the right or the left, such as writing \$542.00 as \$54.20 or \$5,420.00. (Ch. 2)
- **solvency** The ability of a firm to pay its debts as they come due. (Chs. 4, 15)
- **special journals** Journals designed to be used for recording a single type of transaction. (Ch. 5)
- **special-purpose funds** Cash funds used for a special business need. (Ch. 7)
- specific identification inventory cost flow method Inventory method in which the unit sold is identified with a specific purchase. (Ch. 6)
- **staff department** A unit that provides services, assistance, and advice to the departments with line or other staff responsibilities. (Ch. 16)
- **standard cost** A detailed estimate of what a product should cost. (Ch. 22)
- **standard cost systems** Accounting systems that use standards for each element of manufacturing cost entering into the finished product. (Ch. 22)
- **standards** Performance goals, often relating to how much a product should cost. (Ch. 22)
- **statement of cash flows** A summary of the cash receipts and cash payments for a specific period of time, such as a month or a year. (Chs. 1, 14)
- statement of cost of goods manufactured The income statement of manufacturing companies. (Ch. 16)
- **statement of stockholders' equity** A summary of the changes in the stockholders' equity in a corporation that have occurred during a specific period of time. (Ch. 11)
- **static budget** A budget that does not adjust to changes in activity levels. (Ch. 21)
- stock Shares of ownership of a corporation. (Ch. 11)
- **stock dividend** A distribution of shares of stock to its stockholders. (Ch. 11)
- **stock split** A reduction in the par or stated value of a common stock and the issuance of a proportionate number of additional shares. (Ch. 11)

- stockholders The owners of a corporation. (Ch. 11)
- **stockholders' equity** The owners' equity in a corporation. (Chs. 1, 2)
- **straight-line method** A method of depreciation that provides for equal periodic depreciation expense over the estimated life of a fixed asset. (Ch. 9)
- **strategic planning** The development of a long-range course of action to achieve business goals. (Ch. 16)
- strategies The means by which business goals and objectives will be achieved. (Ch. 16)
- **subsidiary company** The corporation that is controlled by a parent company. (Ch. 13)
- **subsidiary inventory ledger** The subsidiary ledger containing individual accounts for items of inventory. (Ch. 6)
- **subsidiary ledger** A ledger containing individual accounts with a common characteristic. (Ch. 5)
- **sunk cost** A cost that is not affected by subsequent decisions. (Ch. 24)
- **supply chain management** The coordination and control of materials, services, information, and finances as they move in a process from supplier, through the manufacturer, wholesaler, and retailer to the consumer. (Ch. 27)

## T

- **T account** The simplest form of an account. (Ch. 2)
- target costing The target cost is determined by subtracting a desired profit from a market method determined price. The resulting target cost is used to motivate cost improvements in design and manufacture. (Ch. 24)
- **temporary (nominal) accounts** Accounts that report amounts for only one period. (Ch. 4)
- **theory of constraints (TOC)** A manufacturing strategy that attempts to remove the influence of bottlenecks (constraints) on a process. (Ch. 24)
- time tickets The form on which the amount of time spent by each employee and the labor cost incurred for each individual job, or for factory overhead, are recorded. (Ch. 17)
- **time value of money concept** The concept that an amount of money invested today will earn income. (Ch. 25)
- total cost concept A concept used in applying the cost-plus approach to product pricing in which all the costs of manufacturing the product plus the selling and administrative expenses are included in the cost amount to which the markup is added. (Ch. 24)
- total manufacturing cost variance The difference between total standard costs and total actual costs for units produced. (Ch. 22)
- **trade discounts** Discounts from the list prices in published catalogs or special discounts offered to certain classes of buyers. (Ch. 5)
- **trade-in allowance** The amount a seller allows a buyer for a fixed asset that is traded in for a similar asset. (Ch. 9)

- **trademark** A name, term, or symbol used to identify a business and its products. (Ch. 9)
- **trading securities** Securities that management intends to actively trade for profit. (Ch. 13)
- **transfer price** The price charged one decentralized unit by another for the goods or services provided. (Ch. 23)
- **transposition** An error in which the order of the digits is changed, such as writing \$542 as \$452 or \$524. (Ch. 2)
- **treasury stock** Stock that a corporation has once issued and then reacquires. (Ch. 11)
- **trial balance** A summary listing of the titles and balances of accounts in the ledger. (Ch. 2)

- **unadjusted trial balance** A summary listing of the titles and balances of accounts in the ledger prior to the posting of adjusting entries. (Ch. 2)
- **underapplied factory overhead** The amount of actual factory overhead in excess of the factory overhead applied to production during a period. (Ch. 17)
- **unearned revenue** The liability created by receiving revenue in advance. (Chs. 2, 3)
- **unfavorable cost variance** A variance that occurs when the actual cost exceeds the standard cost. (Ch. 22)
- unit contribution margin The dollars available from each unit of sales to cover fixed costs and provide operating profits. (Ch. 19)
- **unit of measure concept** A concept of accounting requiring that economic data be recorded in dollars. (Ch. 1)
- unit price (cost) factor The effect of a difference in unit sales price or unit cost on the number of units sold. (Ch. 20)
- **units-of-output method** A method of depreciation that provides for depreciation expense based on the expected productive capacity of a fixed asset. (Ch. 9)
- **unrealized gain or loss** Changes in the fair value of equity or debt securities for a period. (Ch. 13)

- value-added activity The cost of activities that are needed to meet customer requirements. (Ch. 27)
- value-added lead time The time required to manufacture a unit of product or other output. (Ch. 27)
- value-added ratio The ratio of the value-added lead time to the total lead time. (Ch. 27)
- variable cost concept A concept used in applying the cost-plus approach to product pricing in which only the variable costs are included in the cost amount to which the markup is added. (Ch. 24)
- variable cost of goods sold Consists of direct materials, direct labor, and variable factory overhead for the units sold. (Ch. 20)
- variable costing The concept that considers the cost of products manufactured to be composed only of

those manufacturing costs that increase or decrease as the volume of production rises or falls (direct materials, direct labor, and variable factory overhead). (Chs. 19, 20)

variable costs Costs that vary in total dollar amount as the level of activity changes. (Ch. 19)

**vertical analysis** An analysis that compares each item in a current statement with a total amount within the same statement. (Chs. 3, 15)

**volume variance** The difference between the budgeted fixed overhead at 100% of normal capacity and the standard fixed overhead for the actual production achieved during the period. (Ch. 22)

**voucher** A special form for recording relevant data about a liability and the details of its payment. (Ch. 7)

**voucher system** A set of procedures for authorizing and recording liabilities and cash payments. (Ch. 7)



weighted average inventory cost flow method A method of inventory costing in which the cost of

the units sold and in ending inventory is a weighted average of the purchase costs. (Ch. 6)

whole units The number of units in production during a period, whether completed or not. (Ch. 18)

work in process inventory The direct materials costs, the direct labor costs, and the applied factory overhead costs that have entered into the manufacturing process but are associated with products that have not been finished. (Ch. 16)

working capital The excess of the current assets of a business over its current liabilities. (Chs. 4, 15)



yield A measure of materials usage efficiency. (Ch. 18)



zero-based budgeting A concept of budgeting that requires all levels of management to start from zero and estimate budget data as if there had been no previous activities in their units. (Ch. 21)

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# The Basics

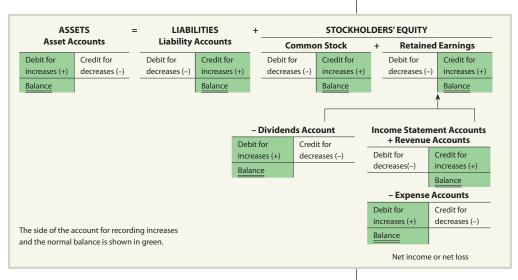
#### **Accounting Equation:**

Assets = Liabilities + Stockholders' Equity

#### T Account:

Account Title		
Left side	Right side	
debit	credit	

#### **Rules of Debit and Credit:**



#### **Accounting Cycle:**

- 1. Transactions are analyzed and recorded in the journal.
- 2. Transactions are posted to the ledger.
- 3. An unadjusted trial balance is prepared.
- 4. Adjustment data are assembled and analyzed.
- 5. An optional end-of-period spreadsheet is prepared.
- 6. Adjusting entries are journalized and posted to the ledger.
- 7. An adjusted trial balance is prepared.
- 8. Financial statements are prepared.
- 9. Closing entries are journalized and posted to the ledger.
- 10. A post-closing trial balance is prepared.

#### **Types of Adjusting Entries:**

- Prepaid expense (deferred expense)
- Unearned revenue (deferred revenue)
- Accrued revenue (accrued asset)
- Accrued expense (accrued liability)
- · Depreciation expense

Each entry will always affect both a balance sheet account and an income statement account.

#### **Analyzing and Journalizing Transactions**

- Carefully read the description of the transaction to determine whether an asset, liability, capital stock, retained earnings, revenue, expense, or dividends account is affected.
- For each account affected by the transaction, determine whether the account increases or decreases.
- Determine whether each increase or decrease should be recorded as a debit or a credit, following the rules of debit and credit.
- 4. Record the transaction using a journal entry.
- 5. Periodically post journal entries to the accounts in the ledger.
- 6. Prepare an unadjusted trial balance at the end of the period.

#### **Financial Statements:**

- Income statement: A summary of the revenue and expenses of a business entity for a specific period of time, such as a month or a year.
- Retained Earnings Statement: A summary of the changes in the retained earnings of a business entity that have occurred during a specific period of time, such as a month or a year.
- Balance sheet: A list of the assets, liabilities, and stockholders'
  equity of a business entity as of a specific date, usually at the close
  of the last day of a month or a year.
- Statement of Cash Flows: A summary of the cash receipts and cash
  payments of a business entity for a specific period of time, such
  as a month or a year.

#### **Closing Entries:**

- Revenue account balances are transferred to an account called Income Summary.
- 2. Expense account balances are transferred to an account called Income Summary.
- The balance of Income Summary (net income or net loss) is transferred to Retained Earnings.
- The balance of the owner's drawing account is transferred to Retained Earnings.

#### **Shipping Terms:**

Ownership (title)	FOB Shipping Point	FOB Destination
passes to buyer when merchandise is	delivered to freight carrier	delivered to buyer
Freight costs are paid by	buyer	seller

#### Format for Bank Reconciliation:

Cash balance according to bank statement		\$XXX
statement	\$XXX	
Bank errors	XXX	XXX \$XXX
Deduct: Deductions by company not on bank		\$^^
statement	\$XXX	
Bank errors	XXX	XXX
Adjusted balance		\$XXX
Cash balance according to company's records		\$XXX
Add: Additions by bank not recorded by company	\$XXX	
Company errors	XXX	XXX \$XXX
Deduct: Deductions by bank not recorded		
by company	\$XXX	
Company errors	XXX	XXX
Adjusted balance		\$XXX

#### **Inventory Costing Methods:**

- First-in, First-out (FIFO)
- Last-in, First-out (LIFO)
- Average Cost

#### **Interest Computations:**

Interest = Face Amount (or Principal)  $\times$  Rate  $\times$  Time

#### **Methods of Determining Annual Depreciation:**

Straight-Line: Cost – Estimated Residual Value
Estimated Life

**Double-Declining-Balance:** Rate* × Book Value at Beginning of Period

*Rate is commonly twice the straight-line rate (1 ÷ Estimated Life).

# Adjustments to Net Income (Loss) Using the Indirect Method:

	Increase
	(Decrease)
Net income (loss)	\$ XXX
Adjustments to reconcile net income to	
net cash flow from operating activities:	
Depreciation of fixed assets	XXX
Amortization of intangible assets	XXX
Losses on disposal of assets	XXX
Gains on disposal of assets	(XXX)
Changes in current operating assets and liabilities:	
Increases in noncash current operating assets	(XXX)
Decreases in noncash current operating assets	XXX
Increases in current operating liabilities	XXX
Decreases in current operating liabilities	(XXX)
Net cash flow from operating activities	\$ XXX
	or
	\$(XXX)
Calaa Vaviable Casta	

#### Variances:

Rate of Return on = Income from Operations
Investment (ROI)

Alternative ROI Computation:

$$ROI = \frac{Income \, from \, Operations}{Sales} \times \frac{Sales}{Invested \, Assets}$$

#### **Capital Investment Analysis Methods:**

Methods That Ignore Present Values:

- Average Rate of Return Method
- · Cash Payback Method

Methods That Use Present Values:

- · Net Present Value Method
- Internal Rate of Return Method

# Abbreviations and Acronyms Commonly Used in Business and Accounting

AAA American Accounting Association

ABC Activity-based costing

AICPA American Institute of Certified Public Accountants

B2B Business-to-business
B2C Business-to-consumer
CFO Chief Financial Officer

CMA Certified Management Accountant COGM Cost of goods manufactured

COGS Cost of goods sold

CPA Certified Public Accountant

Cr. Credit

CVP Cost-volume-profit

Dr. Debit

EFT Electronic funds transfer EPS Earnings per share

ERP Enterprise resource planning

FASB Financial Accounting Standards Board FICA tax Federal Insurance Contributions Act tax

FIFO First-in, first-out FOB Free on board

FUTA Federal unemployment compensation tax
GAAP Generally accepted accounting principles
IASB International Accounting Standards Board
IFRS International Financial Reporting Standards
IMA Institute of Management Accountants

IRC Internal Revenue Code
IRR Internal rate of return
IRS Internal Revenue Service

JIT Just-in-time LIFO Last-in, first-out

LCM Lower of cost or market

MACRS Modified Accelerated Cost Recovery System MD&A Management's Discussion and Analysis

n/30 Net 30

n/eom Net, end-of-month
NPV Net present value
NSF Not sufficient funds
P/E Ratio Price-earnings ratio

POS Point of sale

ROI Return on investment
R&D Research and development
SCM Supply chain management

SEC Securities and Exchange Commission

SOX Sarbanes-Oxley Act TQC Total quality control

W-4 Employee's Withholding Allowance Certificate

WIP Work in process

# **Classification of Accounts**

Account	Account	Normal	Financial
Title	Classification	Balance	Statement
Accounts Payable	Current liability	Credit	Balance sheet
Accounts Receivable	Current asset	Debit	Balance sheet
Accumulated Depletion	Contra fixed asset	Credit	Balance sheet
Accumulated Depreciation	Contra fixed asset	Credit	Balance sheet
Advertising Expense	Operating expense	Debit	Income statement
Allowance for Doubtful Accounts	Contra current asset	Credit	Balance sheet
Amortization Expense	Operating expense	Debit	Income statement
Bonds Payable	Long-term liability	Credit	Balance sheet
Building	Fixed asset	Debit	Balance sheet
Cash	Current asset	Debit	Balance sheet
Cash Dividends	Stockholders' equity	Debit	Retained earnings statement
Cash Dividends Payable	Current liability	Credit	Balance sheet
Common Stock	Stockholders' equity	Credit	Balance sheet
Cost of Merchandise (Goods)	Cost of merchandise	Debit	Income statement
Sold	(goods) sold		
Customer Refunds Payable	Current liability	Credit	Balance sheet
Delivery Expense	Operating expense	Debit	Income statement
Depletion Expense	Operating expense	Debit	Income statement
Discount on Bonds Payable	Long-term liability	Debit	Balance sheet
Dividend Revenue	Other income	Credit	Income statement
Dividends	Stockholders' equity	Debit	Retained earnings statement
Employees Federal Income Tax Payable	Current liability	Credit	Balance sheet
Equipment	Fixed asset	Debit	Balance sheet
Estimated Returns Inventory	Current asset	Debit	Balance sheet
Factory Overhead (Overapplied)	Deferred credit	Credit	Balance sheet (interim)
Factory Overhead (Underapplied)	Deferred debit	Debit	Balance sheet (interim)
Federal Income Tax Payable	Current liability	Credit	Balance sheet
Federal Unemployment Tax Payable	Current liability	Credit	Balance sheet
Finished Goods	Current asset	Debit	Balance sheet
Freight In	Cost of merchandise sold	Debit	Income statement
Freight Out	Operating expense	Debit	Income statement
Gain on Disposal of Fixed Assets	Other income	Credit	Income statement
Gain on Redemption of Bonds	Other income	Credit	Income statement
Gain on Sale of Investments	Other income	Credit	Income statement
Goodwill	Intangible asset	Debit	Balance sheet
Income Tax Expense	Income tax	Debit	Income statement
Income Tax Payable	Current liability	Credit	Balance sheet
Insurance Expense	Operating expense	Debit	Income statement
Interest Expense	Other expense	Debit	Income statement
Interest Receivable	Current asset	Debit	Balance sheet
Interest Revenue	Other income	Credit	Income statement
Investment in Bonds	Investment	Debit	Balance sheet
Investment in Stocks	Investment	Debit	Balance sheet
Investment in Subsidiary	Investment	Debit	Balance sheet
Land	Fixed asset	Debit	Balance sheet
Loss on Disposal of Fixed Assets	Other expense	Debit	Income statement
Loss on Redemption of Bonds	Other expense	Debit	Income statement

Account	Account	Normal	Financial
Title	Classification	Balance	Statement
Loss on Sale of Investments	Other expense	Debit	Income statement
Marketable Securities	Current asset	Debit	Balance sheet
Materials	Current asset	Debit	Balance sheet
Medicare Tax Payable	Current liability	Credit	Balance sheet
Merchandise Inventory	Current asset/Cost of	Debit	Balance sheet/Income
,	merchandise sold		statement
Notes Payable	Current liability/Long-	Credit	Balance sheet
	term liability		
Notes Receivable	Current asset/Investment	Debit	Balance sheet
Patents	Intangible asset	Debit	Balance sheet
Paid-In Capital from Sale of	Stockholders' equity	Credit	Balance sheet
Treasury Stock	ottomioració oquity	0.00	24.4
Paid-In Capital in Excess of	Stockholders' equity	Credit	Balance sheet
Par (Stated Value)	ottomioració oquity	0.00	24.4
Payroll Tax Expense	Operating expense	Debit	Income statement
Pension Expense	Operating expense	Debit	Income statement
Petty Cash	Current asset	Debit	Balance sheet
Preferred Stock	Stockholders' equity	Credit	Balance sheet
Premium on Bonds Payable	Long-term liability	Credit	Balance sheet
Prepaid Insurance	Current asset	Debit	Balance sheet
Prepaid Rent	Current asset	Debit	Balance sheet
Purchases	Cost of merchandise	Debit	Income statement
T dronasos	sold	Bobit	moomo diatomoni
Purchases Discounts	Cost of merchandise	Credit	Income statement
	sold	0.00	
Purchases Returns and	Cost of merchandise	Credit	Income statement
Allowances	sold	0.00	
Rent Expense	Operating expense	Debit	Income statement
Rent Revenue	Other income	Credit	Income statement
Retained Earnings	Stockholders' equity	Credit	Balance sheet/Retained
	ottomioració oquity	0.00	earnings statement
Salaries Expense	Operating expense	Debit	Income statement
Salaries Payable	Current liability	Credit	Balance sheet
Sales Tax Payable	Current liability	Credit	Balance sheet
Social Security Tax Payable	Current liability	Credit	Balance sheet
State Unemployment Tax Payable	Current liability	Credit	Balance sheet
Stock Dividends	Stockholders' equity	Debit	Retained earnings statement
Stock Dividends Distributable	Stockholders' equity	Credit	Balance sheet
Supplies	Current asset	Debit	Balance sheet
Supplies Expense	Operating expense	Debit	Income statement
Treasury Stock	Stockholders' equity	Debit	Balance sheet
Uncollectible Accounts Expense	Operating expense	Debit	Income statement
Unearned Rent	Current liability	Credit	Balance sheet
Utilities Expense	Operating expense	Debit	Income statement
Vacation Pay Expense	Operating expense	Debit	Income statement
Vacation Pay Payable	Current liability/Long-	Credit	Balance sheet
vacation ray rayable	term liability	Orean	Dalailoe Sileet
Work in Process	Current asset	Debit	Balance sheet
**OIX III I 100633	Julient asset	Denit	Daidillo Silect

# What Successful Students Are Saying

In a recent survey of students who took financial and managerial accounting courses, students stated that, in order to be successful in these courses, students should (in order of importance):

- Complete assigned homework
- Attend class and pay attention during the lecture
- Study
- Ask for help or get a tutor
- Complete ungraded practice assignments or review exercises

You just need to put in the effort. If you work of control the homework problems and show of control to class, you will do well.

—Brandy J. Gibson, Business Administration Major Ivy Tech Community College Did you read the chapter from the required

Lextbook prior to attending class?

Did you attend class?

Did you take notes during class?

during or after class when you did not

understand a concept being taught?

Did you complete all assigned homework?

assignments or review exercises to better

Did you obtain an explanation from the

Did you utilize additional resources provided

Such as demonstration videos & tutorials?

Successful students spent an average of 4 hours per week outside of class time studying, including completing assigned homework.

Do not put off homework – it is more important than you know – and when in need – ASK FOR HELP!!

—Sally Cross, Accounting Major Ivy Tech Community College

You need to attend every class and pay attention. Take good notes and do all the homework.

—Melinda Lallier, Accounting Major Community College of Rhode Island

Come to class every day – if you miss a class, you miss a lot of notes and example problems. Homework is vital and so is studying for tests – you need to learn the different formulas and equations.

—Shannon Green, General Business Major Community College of Rhode Island

Anyone can succeed at learning & understanding accounting concepts!

How? Preparation, time management, & practice!